TOSHIBA

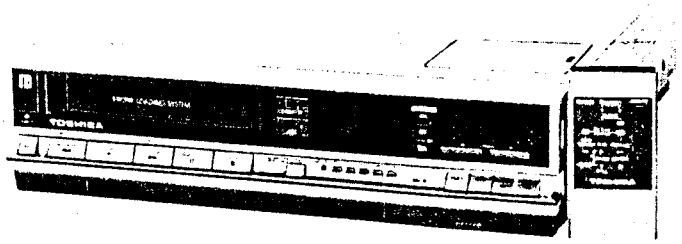
COLOR VIDEO CASSETTE RECORDER

V-M42/C

SERVICING DIAGRAMS

(V-M422,423,V-600C,AH-350)

Adjustment procedures are the same as those for the V-M41 chassis. For information on the adjustment procedures, refer to the manual for the V-M41 (FILE No. 030-093-4).



SPECIFICATIONS

GENERAL

Video recording system:	Rotary two-head helical scanning
Head configuration:	2-head rotary (HEAD: A, B)
Video signal:	EIA standard NTSC color
Storage temperature:	−20°C to +60°C (−4°F to +140°F)
Operating temperature:	5°C to 40°C (41°F to 104°F)
Antenna:	75-ohms external antenna terminal for VHF 300-ohms external antenna terminal for UHF
Channel coverage:	VHF channels 2−13 UHF channels 14−83 CATV channels A2, A1, A−I, J−W, AA−JJ
VHF output signal:	Channel 3 or 4 (selectable) 75-ohms unbalanced

SWITCH POSITION	CHANNEL
VL ch	2−6
VH ch	A2, A1, A−I, 7−13
U ch	14−83
CATV ch	J−W, AA−JJ

Power consumption	32W (8W with power off)
Weight:	7.7 kg
Dimensions:	420 × 105 × 382 mm (W × H × D)

VIDEO

Input:	VIDEO LINE IN: Pin jack-type connector 1.0V (p-p) 75-ohms unbalanced, sync. negative

VIDEO

Output:	VIDEO LINE OUT: Pin jack-type connector 1.0V (p-p) 75-ohms unbalanced, sync. negative
Signal to noise ratio:	Better than 45 dB

AUDIO

Input:	AUDIO LINE IN: Pin jack-type, 47k-ohms, −10 dBs
Output:	AUDIO LINE OUT: Pin jack-type, less than 10k-ohms, −7 dBs, unbalanced (load: more than 47k-ohms)
Frequency response:	(ßII): 50 Hz to 8 KHz (ßIII): 50 Hz to 7 KHz
Signal to noise ratio:	Better than 40 dB
Audio distortion:	Less than 4% at 400 Hz

TAPE TRANSPORT

Tape speed:	ßII 20 mm/sec., ßIII 13.3 mm/sec.
Maximum recording time:	300 min. with Toshiba L-830 tape (ßIII mode)
Fast forward time:	Within 4.5 min. (L-500)
Rewind time:	Within 4.5 min. (L-500)

TIMER

Fluorescent digital display
Count down from AC line frequency.

Remote Control Unit

11 key: 15 modes. Infrared Remote Control Operation

Design and specifications are subject to change without notice.

Caution: The unauthorized recording of television programmes and other materials may infringe on the rights of others.

SAFETY NOTICE

SAFETY PRECAUTIONS

LEAKAGE CURRENT CHECK

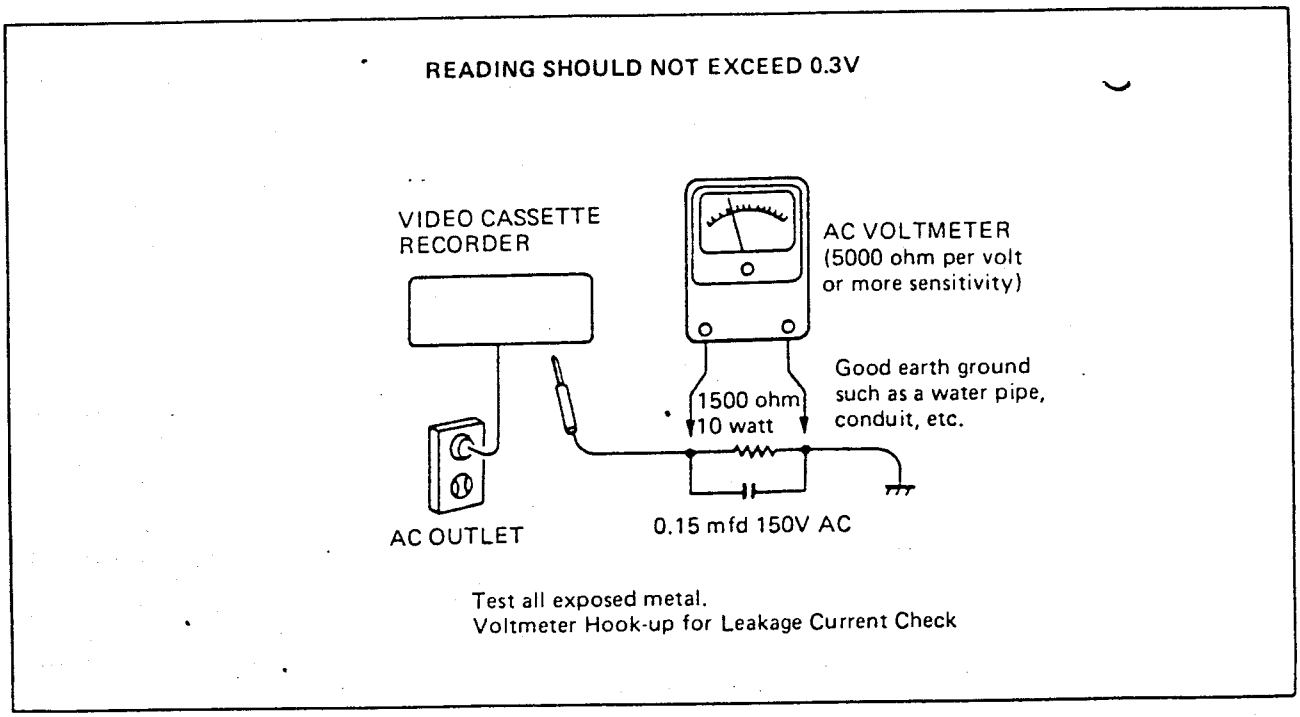
Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 ohms per volt or more sensitivity.

Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet, screwheads, metal overlays, control shafts, etc.).

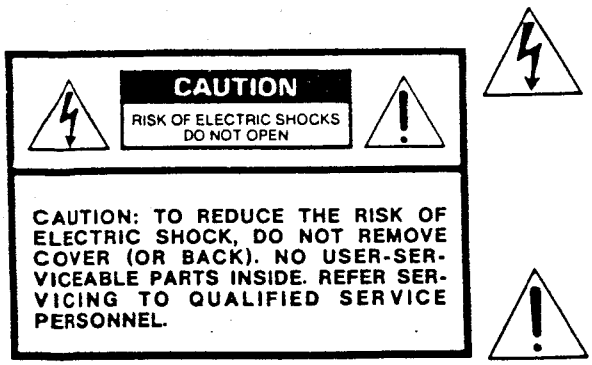
Measure the AC voltage across the 1500 ohm resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 volts. A reading exceeding 0.3 volts indicates that a dangerous potential exists, the fault must be located and corrected.

Repeat the above test with the VCR power plug reversed.

NEVER RETURN A VCR TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.


READING SHOULD NOT EXCEED 0.3V
VIDEO CASSETTE RECORDER
AC VOLTMETER (5000 ohm per volt or more sensitivity)
Good earth ground such as a water pipe, conduit, etc.
1500 ohm 10 watt
AC OUTLET
0.15 mfd 150V AC

Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check


CAUTION
RISK OF ELECTRIC SHOCKS DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CONTENTS

2. SERVICING DIAGRAM

1. Inspection Flow Chart 1
2. Removal of Cabinet 2
3. Mechanical Parts Location Diagram 3
4. Electrical Units Location Diagram 5
5. Part Configuration and their Symbols ... 6
6. Printed Wiring Board and Schematic Diagram 8
7. Power Supply Block Diagram 11
8. Power Supply PC Board 12
9. Power Supply Circuit 14
10. Timer, Channel Selector and Electronic Counter Block Diagrams 16
11. Timer, Channel Selector and Electronic Counter PC Board 20
12. Timer, Channel Selector and Electronic Counter Circuits 22
13. PIF and Channel Selector Block Diagrams 25
14. PIF and Channel Selector PC Board 27
15. PIF, Channel Selector, Antenna Switch and RF Modulator Circuits 28
16. Mechanism and System Control Block Diagram 31
17. Logic PC Board 37
18. Logic Circuit 40
19. Servo Block Diagram 43
    - Record Mode 43
    - Play Mode 44
    - Cue/Review 46
20. Servo PC Board 48
21. Servo Circuit 50
22. Video Block Diagram 53
    - Rec Mode 53
    - Play Mode 56
23. Video PC Board 59
24. Video Circuit 62
25. Audio Block Diagram 65
    - Rec Mode 65
    - Play Mode 66
26. Audio PC Board 67
27. Audio Circuit 68
28. Remote Control Block Diagram 71
29. Remote Control Transmission Circuit ... 72
30. Remote Control Adjustment 73

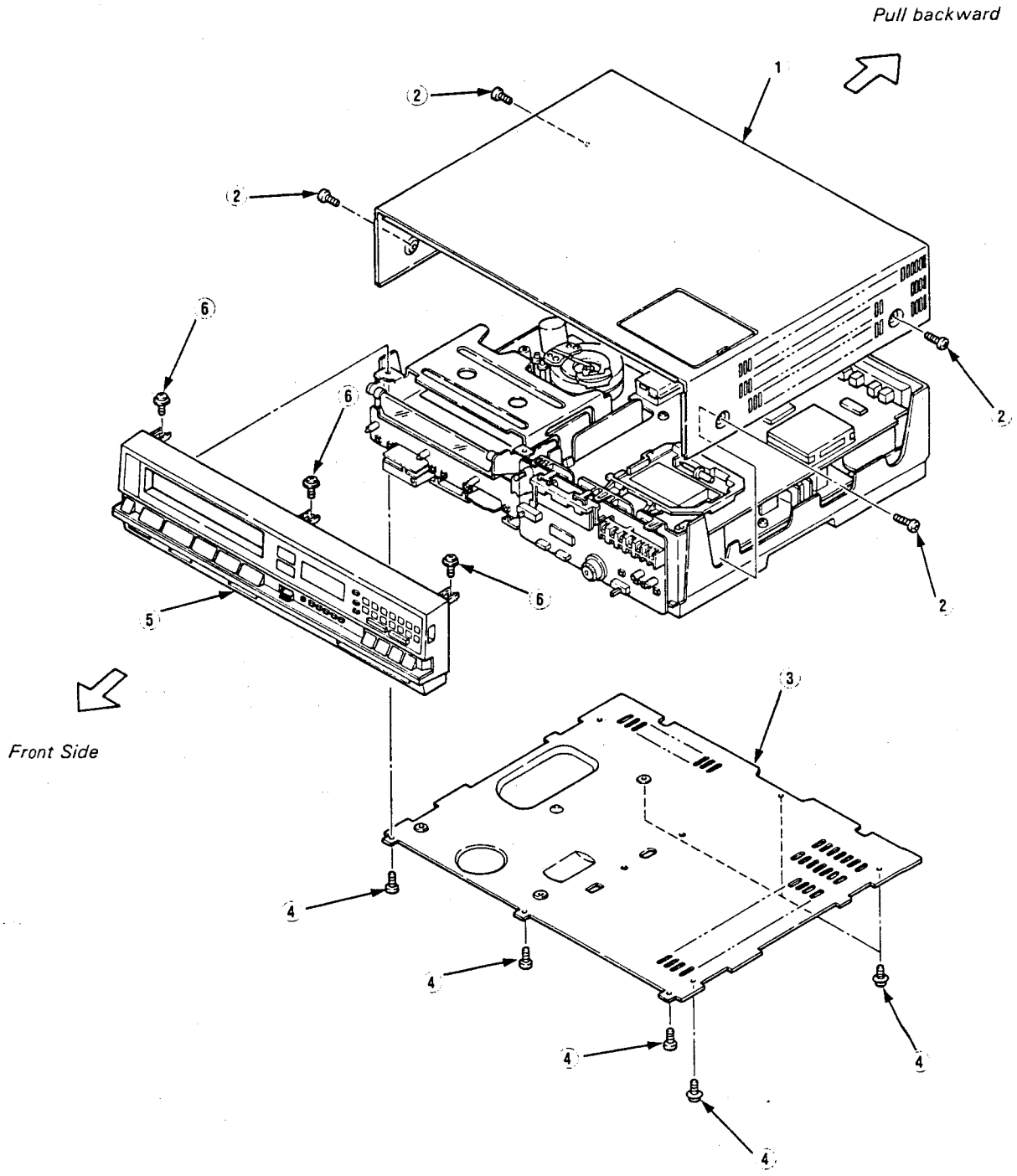
1. Inspection Flow Chart

Operation Steps		Items to be confirmed	Inspection block diagram	Page
1. AC Plug-in	Time adjustment	Clock display	Power supply block (AC line system)	11
	Program timer setting	Clock setting operation	Timer counter block	16
2. Power SW ON	TV/VCR SW (to VCR)	Indication lamp	Power supply block (DC line system)	11
	Channel selector operation, AFT operation	TV receiving condition	System control	31
	EE picture quality	CH select, AFT operation level	PIF and channel selector block	25
	EE sound quality	EE picture quality/ signal level	Video (EE, REC mode)	53
	TV/VCR SW (to TV)	EE sound quality/ signal level	Audio (EE, REC mode)	65
3. Cassette In/Out	Cassette-in	FL mechanism operation	Mechanism and system control block	31~36
	Tape loading	Loading operation		
	Eject Tape unloading Cassette-out	Eject operation Indication lamp Abnormal noises		
4. Key entry operation (Remote control)	Playback, recording	Indication lamp	Mechanism and system control block	31~36
	Cue/Review	Operation of each mode (tape drive operation)	Remote control block	71
	Still/slow	Abnormal noises		
	FF/REW			
5. Playback performance (picture quality, audio quality, etc.)	Playback (Test tape ßII/ßIII) Cue/Review/Stop/Slow	Resolution, S/N Hue, saturation, color uneveness, color dropout Audio distortion, level variation, picture noise, picture vertical bends, picture horizontal bends, skew distortion, Flicker, beat	Video playback system	56
			Audio playback system	66
6. Recording/ Playback performance (picture quality, audio quality, etc.)	Recording/Playback performance	Resolution, S/N	Video recording system	53
		Hue, saturation, color uneveness, color dropout Audio distortion, level variations, picture noise, vertical bends, picture horizontal bends, skew distortion, flicker, beat.	Audio recording system	65

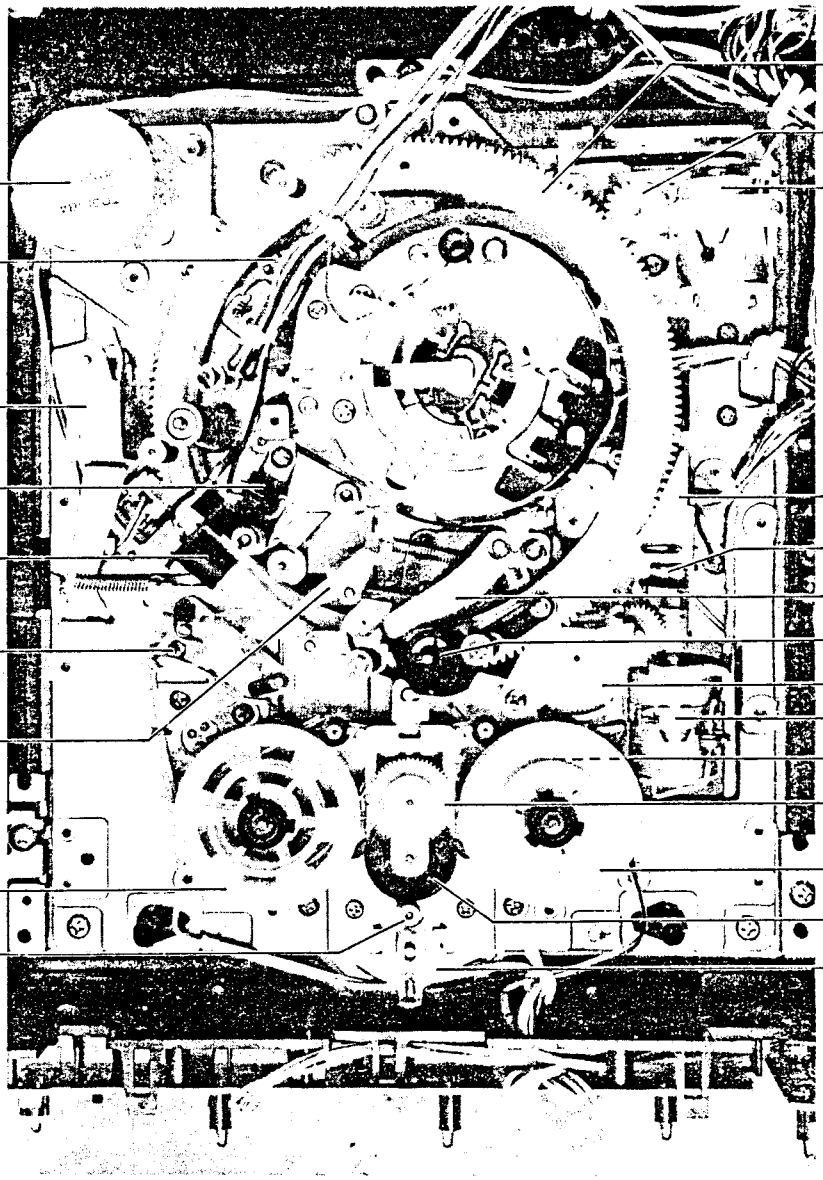
How to use the table
1. When inspecting a defective VCR, proceed according to the steps shown in the table.
2. Check the items to be confirmed for each operation step.
3. If a problem is found on the item, check waveforms (level) referring to the block diagram relating to the items.
4. PC board pattern diagram and schematic diagram are prepared in a page following the block diagram. Use them to examine the circuit precisely.
5. After completion of the repair work, check steps 1 to 6 again.

2. Removal of Cabinet

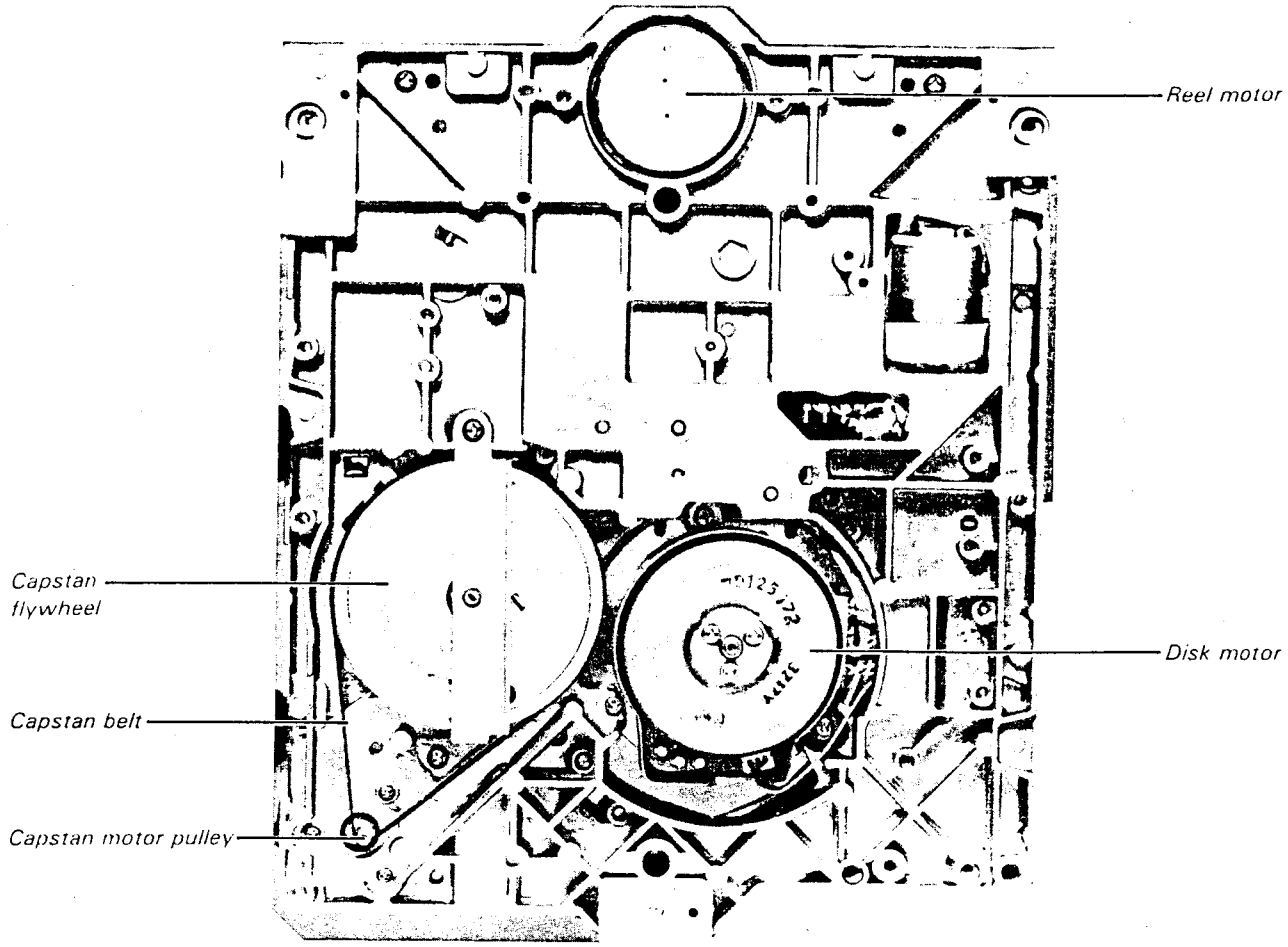
(1) Disconnect power cord plug from AC outlet.
(2) Remove 4 screws (2) securing top cover (1).
(3) Remove the top cover (1) by sliding it backward.
(4) Remove 7 screws (4) securing bottom cover (3), then remove the bottom cover.
(5) Remove 3 screws (6) securing front panel (5).
(6) Remove the front panel (5).



3. Mechanical Parts Location Diagram

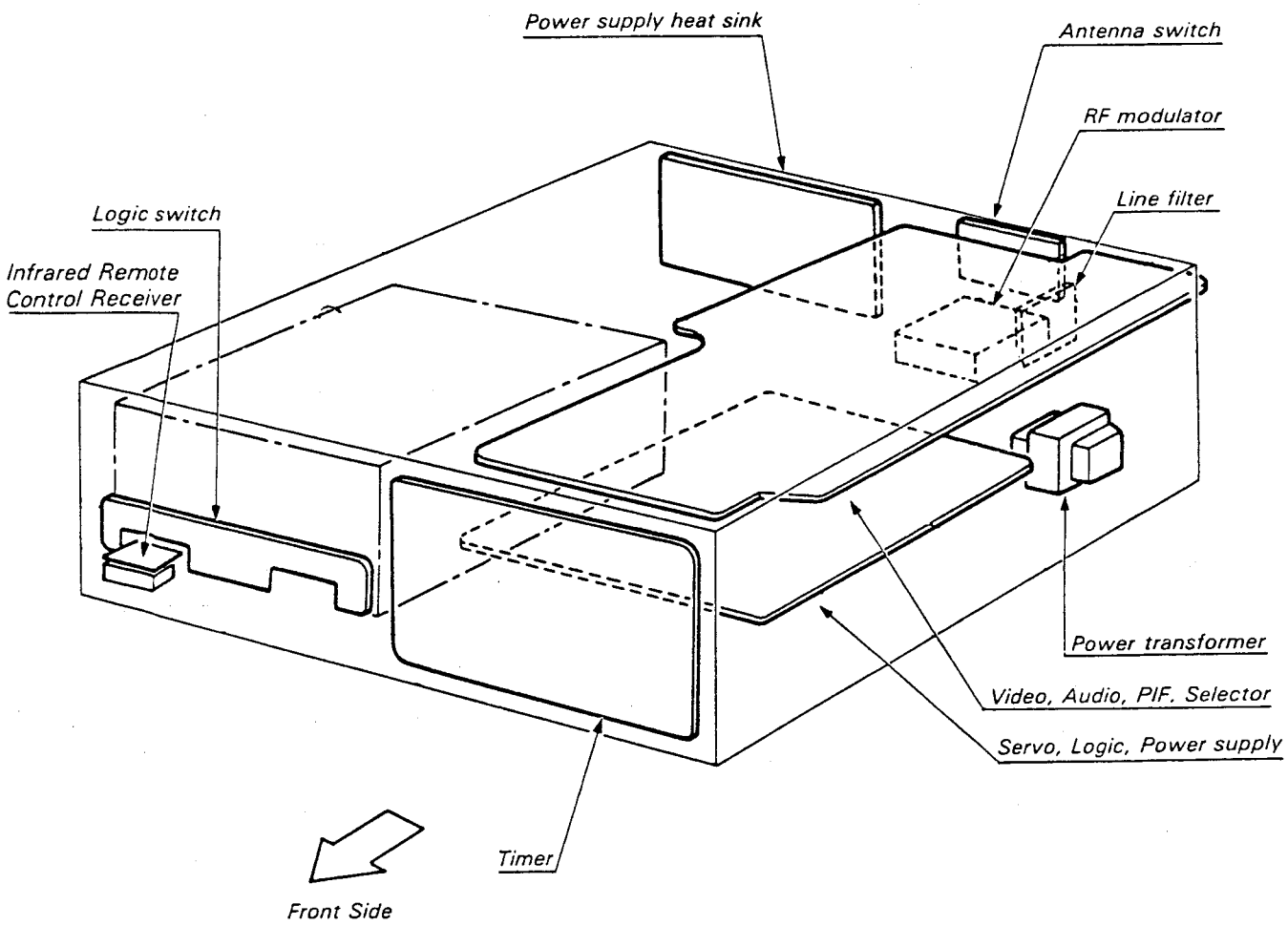


Top view


Reel motor
Capstan flywheel
Capstan belt
Capstan motor pulley
Disk motor

Bottom View

4. Electrical Units Location Diagram

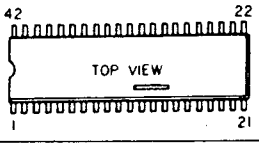
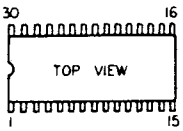
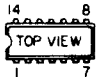
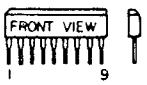
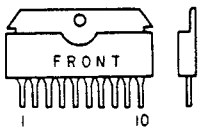


5. Part Configuration and their Symbols

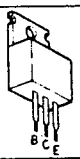
NOTE: Precautions for Part Replacement

- In the schematic diagram, parts marked ⚠ (ex. R810) are critical parts to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
- Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire, etc.

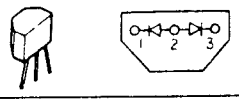
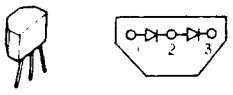
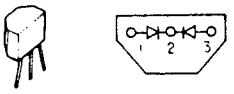
1. IC's

Name	Shape
TA7788P, TD6314P-01 TMP6320-6358Y TMP4320-6391Y TCP4633-9822X	
TA7788AP TA7744P	
TA7743P	
TA7607AP, TA7742P TA7740P, TL8610P TC4028BP, TD62504P SN7442AN	
TA75902P TA7741P	
TA7337P, TA7365P μPC1474HA TA7325P, TA7351P TA75393S	
TA7361P	
TA7277AP	

2. Transistors

Name	Shape
2SA562TM-Y 2SC1959-Y 2SC1815-Y 2SA1015-Y 2SC388ATM	
2SK30ATM-Y	
2SA966-Y 2SC2236-Y	
2SA1048-Y, 2SC2458-Y RN1201, RN1202 RN1203, RN1204 RN2201, RN2202 RN2203	
2SD549	
2SB435-Y 2SD880-Y	
PST520C	

3. Diode

Name	Shape
1S1554(TV) 1S1555(TV)	Polarity
1SS200	
1SS227	
1SS201	
μPC574J	
05Z8.2-X, 05Z5.6-Z 05Z3.9-Z, 05Z3.6-Z 05Z4.7-Y, 05Z12-Y 05Z5.1-X	Silver band Polarity Indication

Name	Shape
1SS176	Green band Polarity
ERC01-02FL	White band 02 Polarity
ERA12-02	White band Polarity
TLUG163 TLOR163	(Green, red) Anode Cathode
TLG113A TLR113A	Color (Green, Red) Anode Cathode

4. Solid resistor indication

Resistor	1/8W film	P type film	U type film	Solid	Oxide film	Metal film	Cement	Fuse
Symbol	None	P	U	S	R	W	W	RF

Tolerance	±2%	±5%	±10%	±20%
Symbol	G	J	None	None

- All film type and oxide film type resistors used are ±5%, so the tolerance symbol was not indicated for them.

5. Capacitor indication

Description	Symbol	Capacitance, unit	Capacitance allowance
Electrolytic	⊣⊢	μF	Not indicated
Special electrolytic			Indicated
Plastic film	⊣⊢	μF: indicated with numbers below decimal point PF: indicated with numbers over decimal point	Indicated below ±5% (J), indicated over ±0.5% PF, not indicated for others
Ceramic			
Trimmer	⊣⊢	PF	Not indicated

(Note) No working voltage is indicated for capacitors rated at 50V except electrolytic capacitors.

6. Waveform and voltage measurement

- Measurement of waveform and voltage at each section in the color circuits was conducted with sufficient service color bar signal being received and reproduced in normal conditions.
- Waveforms and voltage values for the remaining circuit were measured with a broadcasting signal normally received, so they may vary slightly according to the programs being received. Use then as a measure for servicing.
- All voltage values except the waveforms were DC voltages and measured by a digital voltmeter.

6. Printed Wiring Board and Schematic Diagam

SIGNAL LINE INPUT
SIGNAL LINE OUTPUT
SERVO LINE
LOGIC LINE

H002 VHF ANTENNA TERMINAL RF MODULATOR
VHF OUT VHF IN
BLU 1 AUDIO IN
GRN 2 ANT SW
BLK 3 GND
4 GND
WHT 5 VIDEO IN
P002
+ 5V 1 YEL
ANT SW 2 BLU
GND 3 BLK

H003 UHF ANTENNA TERMINAL
UHF

WA02
WA02

U102 PIF, SELECTOR, VIDEO, AUDIO
H001 VHF UHF
E.T.
PIF SELECTOR CIRCUIT
PA01(WHT)
D 1 VLT
EVER 5V 2 BLU
B 3 WHT
C 4 GRN
A 5 YEL
MUTE 6 BRN
AFT SW
GND (AFT SW)
WA03

H031 AUDIO ERASE
H032 FULL ERASE
W103
RED
P702(WHT)
1 GND
WHT 2 ERASE HEAD
AUDIO CIRCUIT
W101
P701(BLK)
2 GND
H031 AUDIO HEAD
(GRN)
P207(BRN)
AUDIO OUT 1 BLU
GND 2 BLK
VIDEO OUT 3 WHT
P203(WHT)
AII/AIII 1 WHT
V-SYNC 2 BLU
3.58MHz 3 WHT
GND 4 GRY
SW 5 GRY
CTL 6 GRN
W110
P101(BRN)
3 GND
4 GND
H011 VIDEO HEAD A
H012 VIDEO HEAD B
PG
VIDEO CIRCUIT
P202(BLK)
VIDEO MUTE 1 BRN
AUDIO MUTE 2 GRN
TRICK 3 BLU
REC +6.5V 4 GRY
PLAY +6.5V 5 WHT
W201
GND
P206(BRN)
1 SW PULSE
2 GND
3 PB.ENVELOPE
4 AII/AIII
5 CTL
TEST POINT
P201(RED)
+12V 1 RED
+6.5V 2 ORG
GND AUDIO 3 BLK
GND VIDEO 4 BLK
32V +B 5 BLU
AUDIO OUT
VIDEO OUT
AUDIO IN
VIDEO IN

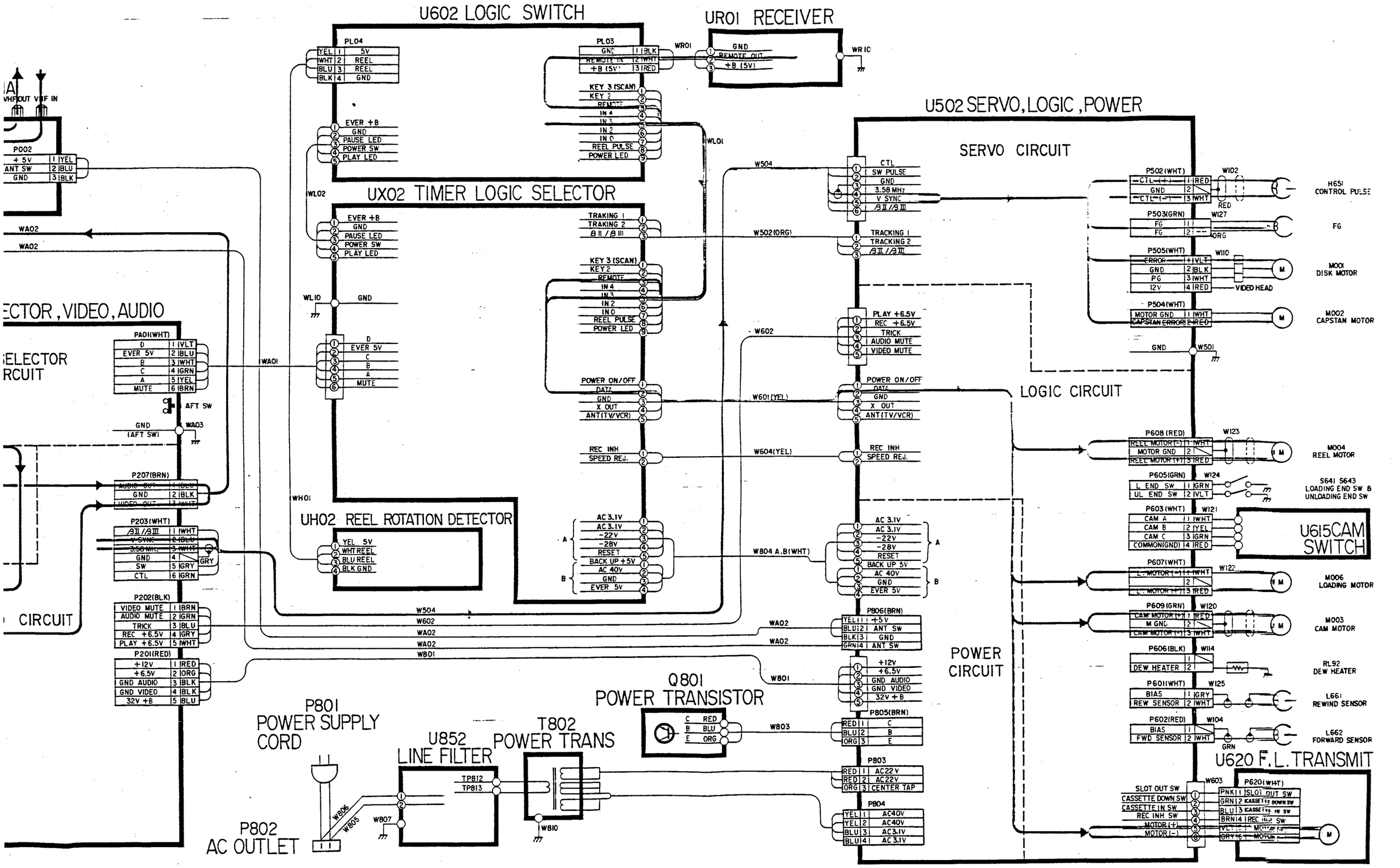
WA01

U602 LOGIC SWITCH
PL04
YEL 1 5V
WHT 2 REEL
BLU 3 REEL
BLK 4 GND
EVER +B
GND
PAUSE LED
POWER SW
PLAY LED
PL03
GND 1 BLK
REMOTE IN 2 WHT
+B (5V) 3 RED
KEY 3 (SCAN)
KEY 2
REMOTE
IN 4
IN 3
IN 2
IN 0
REEL PULSE
POWER LED
WR01
WL01
UR01 RECEIVEI
GND
REMOTE OUT
+B (5V)

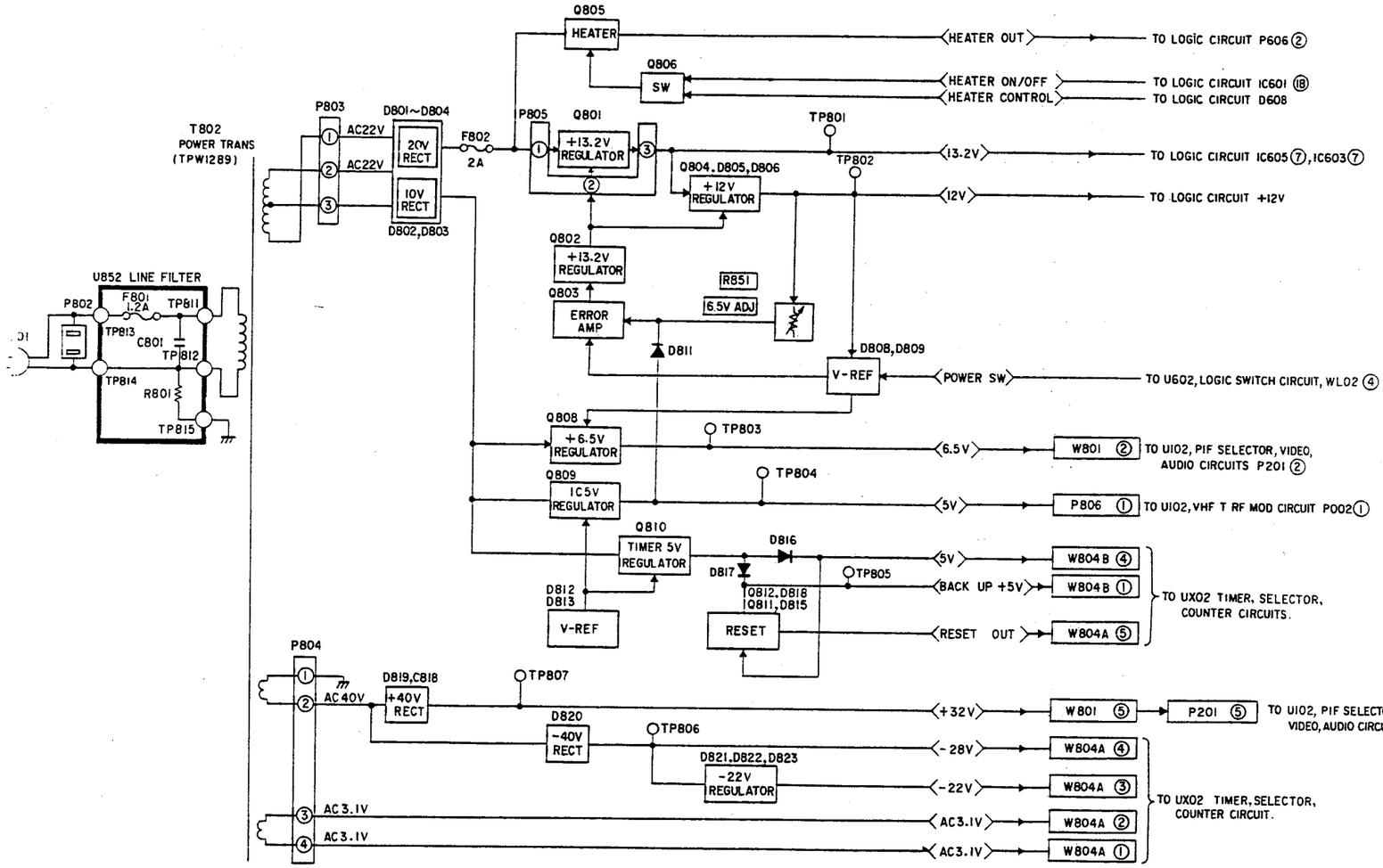
WL02
UX02 TIMER LOGIC SELECTOR
EVER +B
GND
PAUSE LED
POWER SW
PLAY LED
TRAKING 1
TRAKING 2
BII / BIII
KEY 3 (SCAN)
KEY 2
REMOTE
IN 4
IN 3
IN 2
IN 0
REEL PULSE
POWER LED
W504
W502(ORG)
W602
WL10
GND
D
EVER 5V
C
B
A
MUTE
POWER ON/OFF
DATA
GND
X OUT
ANT(TV/VCR)
W601(YEL)
REC INH
SPEED REJ.
W604(YEL)
WH01
UH02 REEL ROTATION DETECTOR
YEL 5V
WHT REEL
BLU REEL
BLK GND
AC 3.1V
AC 3.1V
-22V
-28V
RESET
BACK UP +5V
AC 40V
GND
EVER 5V
A
B
W804 A.B(WHT)
W504
W602
WA02
WA02
WA02
W801
W801
W803

Q801 POWER TRANSISTOR
C RED
B BLU
E ORG

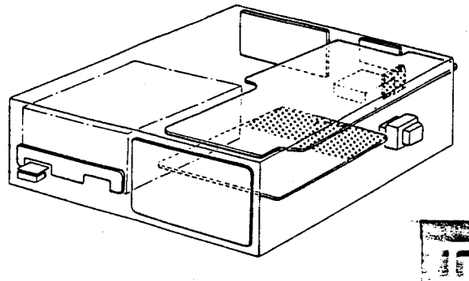
P801 POWER SUPPLY CORD
U852 LINE FILTER
T802 POWER TRANS
TP812
TP813
W806
W805
W807
W810
P802 AC OUTLET


U602 LOGIC SWITCH
UR01 RECEIVER
PL04
PL03
GND
REMOTE IN
+B (5V)
REMOTE OUT
WR01
WR IC
KEY 3 (SCAN)
KEY 2
IN 4
IN 3
IN 2
IN 0
REEL PULSE
POWER LED
EVER +B
PAUSE LED
POWER SW
PLAY LED
WL01
WL02
UX02 TIMER LOGIC SELECTOR
TRAKING 1
TRAKING 2
B II / B III
REMOTE
WL10
D
EVER 5V
C
B
A
MUTE
POWER ON/OFF
DATA
X OUT
ANT(TV/VCR)
REC INH
SPEED REJ.
AC 3.1V
-22V
-28V
RESET
BACK UP +5V
AC 40V
WH01
UH02 REEL ROTATION DETECTOR
YEL 5V
WHT REEL
BLU REEL
BLK GND
U502 SERVO, LOGIC, POWER
SERVO CIRCUIT
W504
W502(ORG)
W602
W601(YEL)
W604(YEL)
W804 A.B(WHT)
CTL
SW PULSE
3.58 MHz
V SYNC
TRACKING 1
TRACKING 2
PLAY +6.5V
REC +6.5V
TRICK
AUDIO MUTE
VIDEO MUTE
LOGIC CIRCUIT
P502(WHT)
W102
H651
CONTROL PULSE
P503(GRN)
W127
FG
P505(WHT)
W110
M001
DISK MOTOR
VIDEO HEAD
P504(WHT)
M002
CAPSTAN MOTOR
W501
P608(RED)
W123
M004
REEL MOTOR
P605(GRN)
W124
S641 S643
LOADING END SW & UNLOADING END SW
P603(WHT)
W121
U615CAM SWITCH
P607(WHT)
W122
M006
LOADING MOTOR
P609(GRN)
W120
M003
CAM MOTOR
P606(BLK)
W114
RL92
DEW HEATER
P601(WHT)
W125
L661
REWIND SENSOR
P602(RED)
W104
L662
FORWARD SENSOR
U620 F.L. TRANSMIT
W603
P620(WHT)
SLOT OUT SW
CASSETTE DOWN SW
CASSETTE IN SW
REC INH SW
MOTOR (+)
MOTOR (-)
P806(BRN)
+5V
ANT SW
GND
+12V
+6.5V
GND AUDIO
GND VIDEO
32V +B
P805(BRN)
P803
AC22V
CENTER TAP
P804
AC40V
AC3.1V
POWER CIRCUIT
Q801
POWER TRANSISTOR
C RED
B BLU
E ORG
W803
P801
POWER SUPPLY CORD
P802
AC OUTLET
W806
W805
W807
W810
U852
LINE FILTER
T802
POWER TRANS
TP812
TP813
W801
W802
WA02
WA01
WA03
P002
VHF OUT
VHF IN
ANT SW
AFT SW
GND (AFT SW)
P207(BRN)
AUDIO OUT
VIDEO OUT
P203(WHT)
V SYNC
3.58 MHz
SW
CTL
P202(BLK)
VIDEO MUTE
AUDIO MUTE
TRICK
REC +6.5V
PLAY +6.5V
P201(RED)
+12V
+6.5V
GND AUDIO
GND VIDEO
32V +B
CIRCUIT
ECTOR, VIDEO, AUDIO
ELECTOR
RCUIT

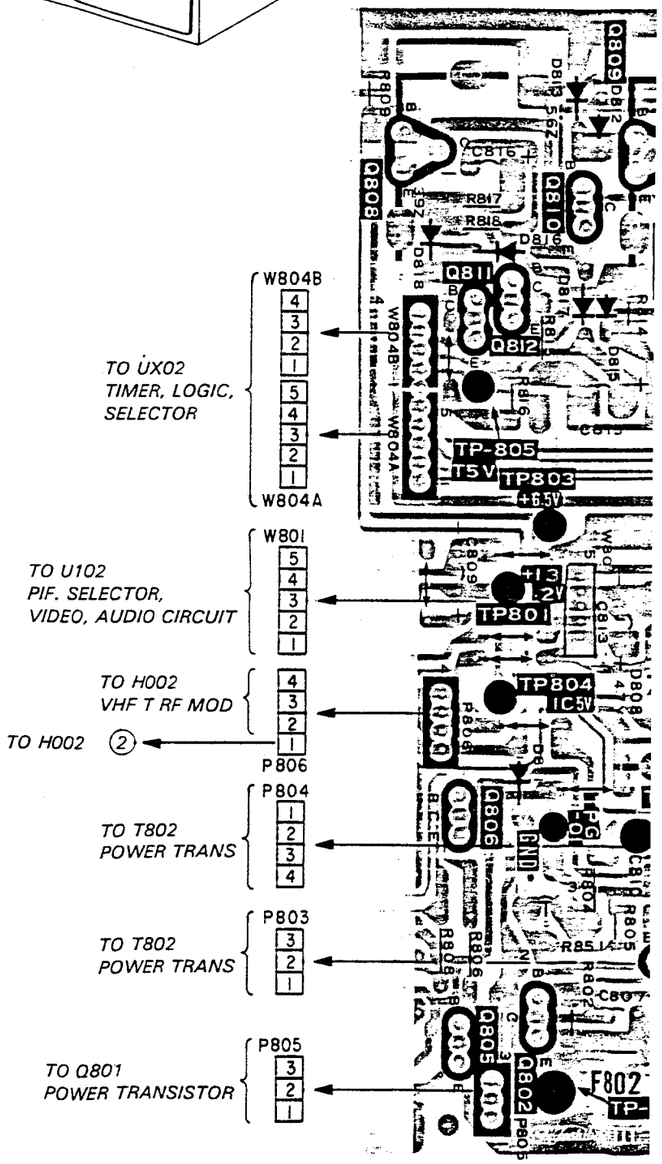
7. Power Supply Block Diagram



8. Power Supply PC Board

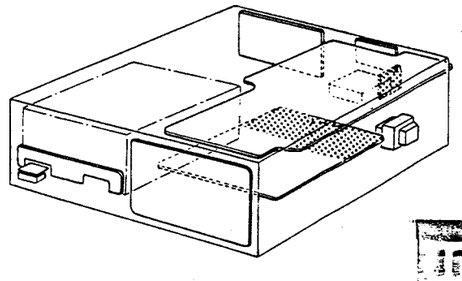


U502 Power supply

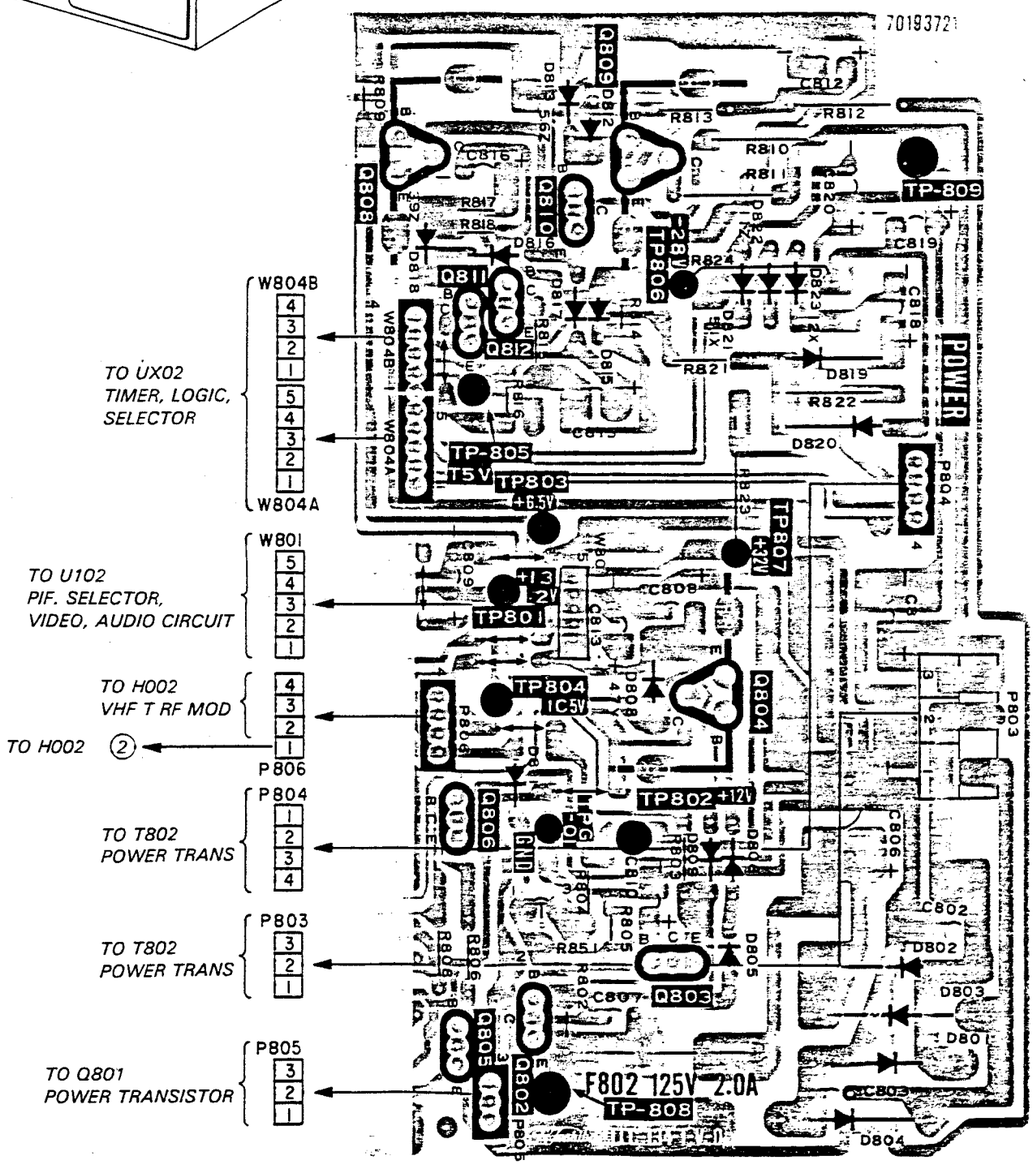


HEATER OUT → TO LOGIC CIRCUIT P606 ②
HEATER ON/OFF → TO LOGIC CIRCUIT IC601 ⑱
HEATER CONTROL → TO LOGIC CIRCUIT D608
13.2V → TO LOGIC CIRCUIT IC605 ⑦, IC603 ⑦
12V → TO LOGIC CIRCUIT +12V
,D809
POWER SW → TO U602, LOGIC SWITCH CIRCUIT, WL02 ④
6.5V → W801 ② TO UI02, PIF SELECTOR, VIDEO, AUDIO CIRCUITS P201 ②
5V → P806 ① TO UI02, VHF T RF MOD CIRCUIT P002 ①
5V → W804B ④
BACK UP +5V → W804B ① → TO UX02 TIMER, SELECTOR, COUNTER CIRCUITS.
RESET OUT → W804A ⑤
+32V → W801 ⑤ → P201 ⑤ TO UI02, PIF SELECTOR, VIDEO, AUDIO CIRCUITS.
-28V → W804A ④
-22V → W804A ③ → TO UX02 TIMER, SELECTOR, COUNTER CIRCUIT.
AC3.1V → W804A ②
AC3.1V → W804A ①

8. Power Supply PC Board



U502 Power supply PC board (Bottom View)



V : Rec/Play mode
□ : EE mode
(V) : Power off mode

Location of Transistors

Symbol No.	Location
Q802	G-4
Q803	G-4
Q804	E-5
Q805	G-4
Q806	F-4
Q808	C-3
Q809	C-4
Q810	C-4
Q811	C-4
Q812	C-4

Location of Diodes

Symbol No.	Location
D801	G-6
D802	G-6
D803	G-6
D804	G-5
D805	G-5
D806	F-5
D808	E-5
D809	F-5
D811	F-4
D813	B-4
D815	C-4
D819	D-5
D820	D-5
D821	C-5
D822	C-5
D823	C-5
D812	C-4
D816	C-4
D817	C-4
D818	C-3

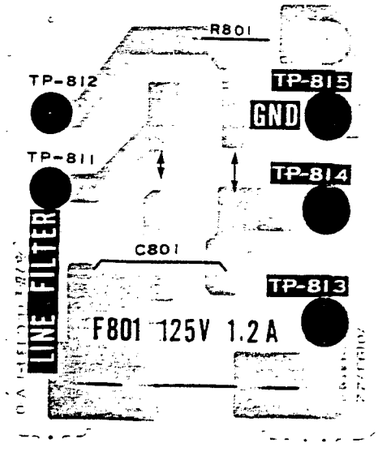
Voltage (V)

Symbol No.	B	E	C
Q802	21.4	22.0	13.9
	22.1	22.6	13.8
	(25.9)	(25.9)	(0V)
Q803	7.1	6.5	21.4
	7.1	6.5	22.1
	(4.6)	(4.2)	(25.9)
Q804	12.6	12.0	13.2
	12.6	12.0	13.2
	(0)	(0)	(0V)
Q805	21.4	22.0	0
	21.9	22.6	22.6
	(25.1)	(25.9)	(25.8)
Q806	0.4	0	21.4
	10.7	10	10.1
	(0.7)	(0	(0.1)
Q808	7.2	6.5	9.6
	7.1	6.5	10.3
	(0)	(0	(12.8)
Q809	5.8	5.2	9.6
	5.8	5.2	10.1
	(5.8)	(5.8	(12.8)
Q810	6.4	5.2	9.6
	6.4	5.2	10.3
	(6.4)	(5.2	(12.8)
Q811	0	0	5.2
	10	10	5.2
	(0)	(0	(5.2)
Q812	0.7	0	0
	10.7	10	10
	(0.7)	(0	(0

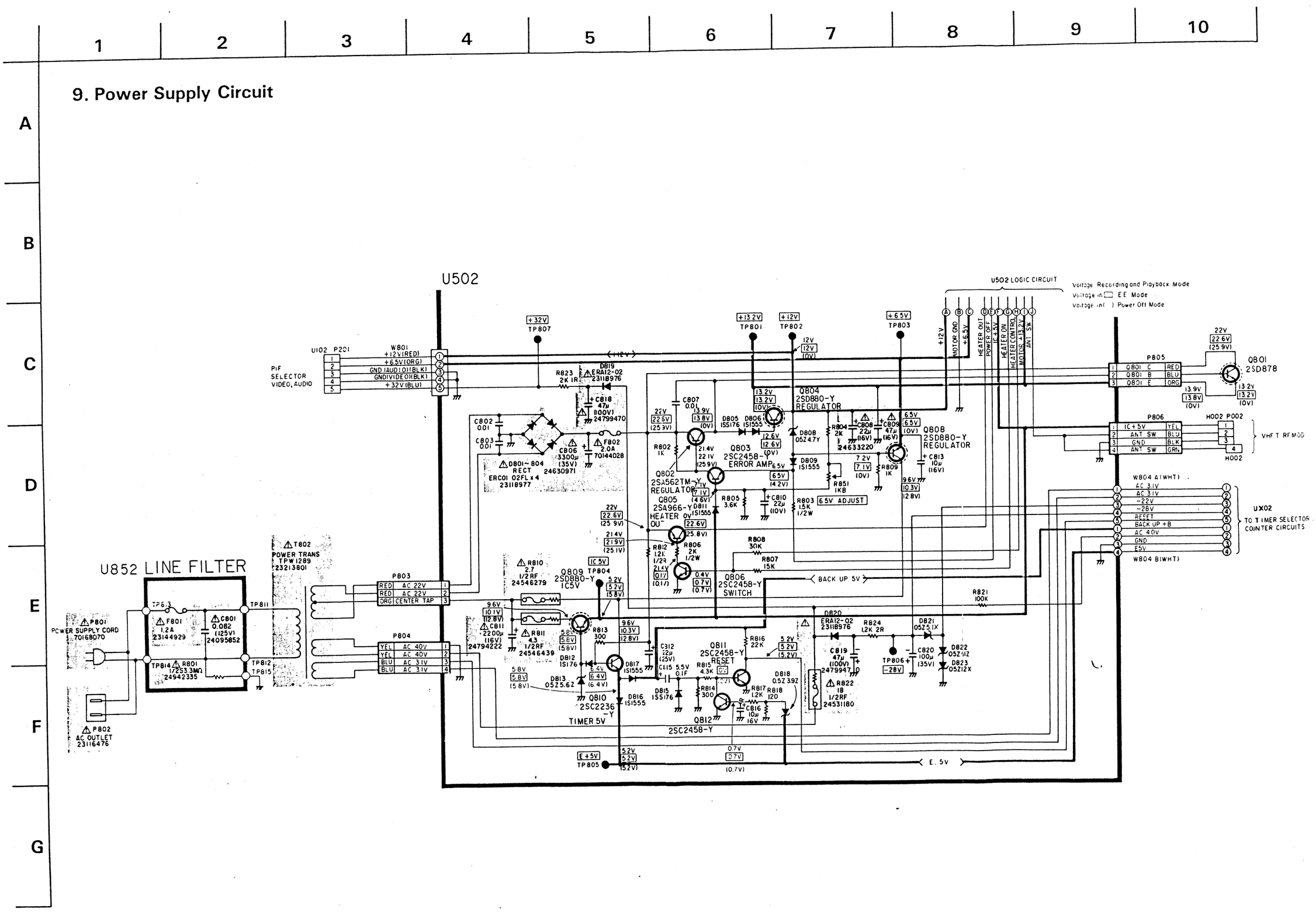
Location of Adjusting VR

Symbol No.	Location
R851	F-4

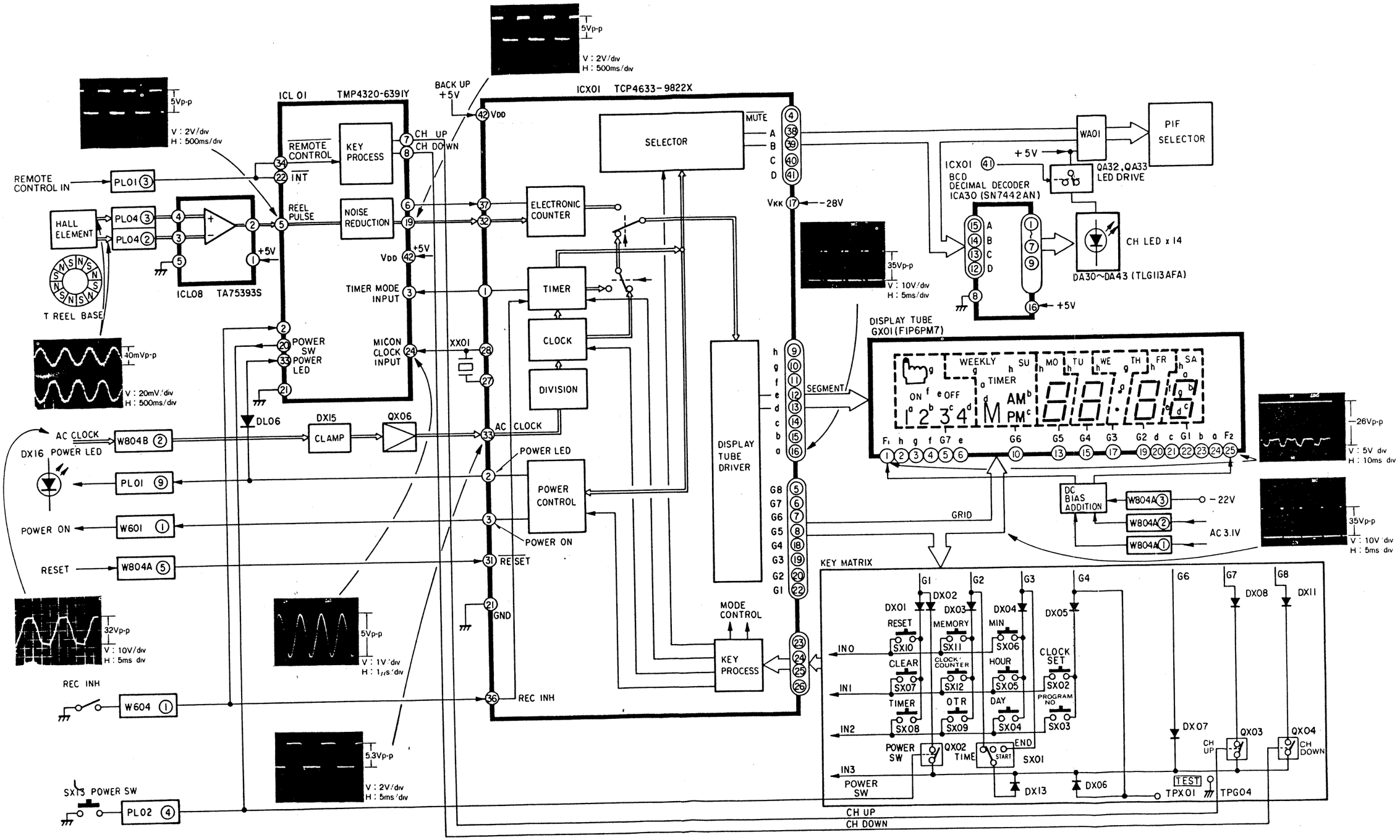
U852 Line filter PC board (Bottom View)

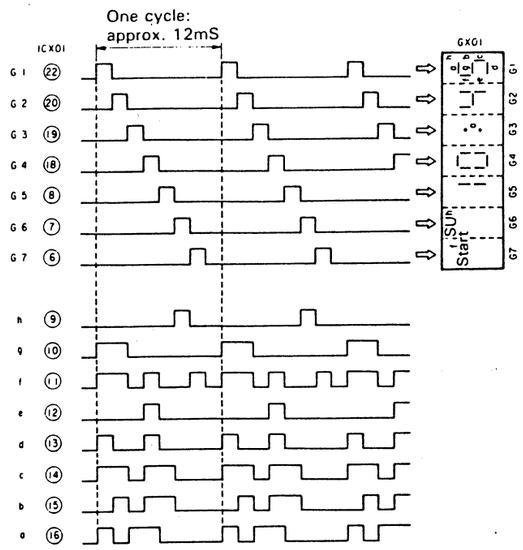


9. Power Supply Circuit

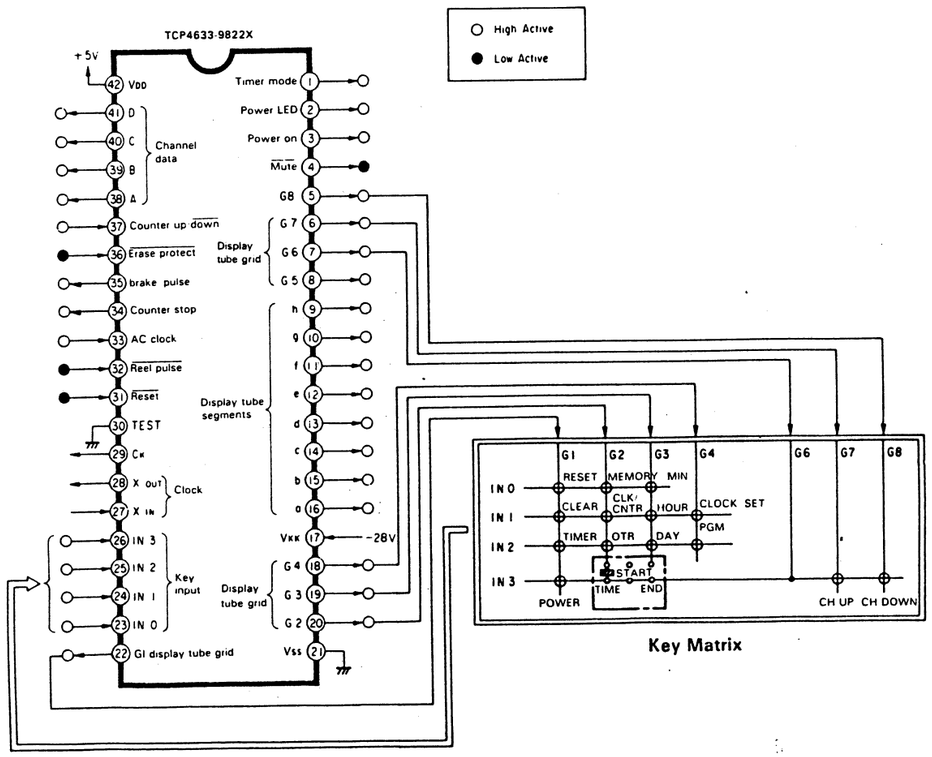


10. Timer, Channel Selector and Electronic Counter Block Diagrams





Timing Chart Example of Fluorescent Display

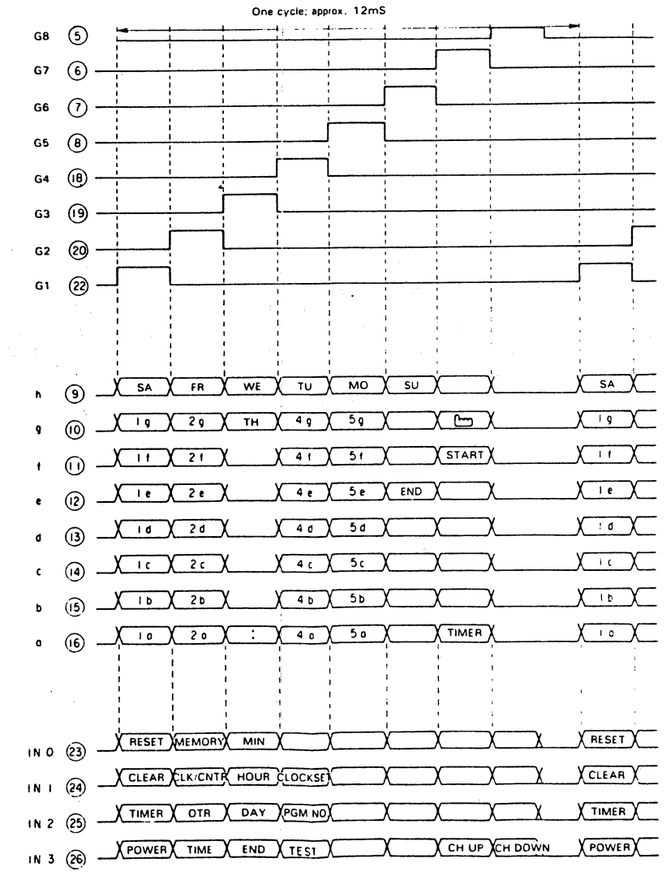


Key Matrix

ICX01 Timer/Counter

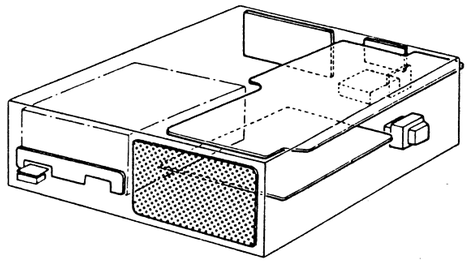
	G 8	G 7	G 6	G 5	G 4	G 3	G 2	G 1
h			SU	MO	TU	WE	FR	SA
g			WEEKLY	Seg • g	Seg • g	TH	Seg • g	Seg • g
f		START		Seg • f	Seg • f		Seg • f	Seg • f
e		END		Seg • e	Seg • e		Seg • e	Seg • e
d		4	M	Seg • d	Seg • d		Seg • d	Seg • d
c		3	PM	Seg • c	Seg • c		Seg • c	Seg • c
b		2	AM	Seg • b	Seg • b		Seg • b	Seg • b
a		1	TIMER	Seg • a	Seg • a	COLON	Seg • a	Seg • a

Display digits and segments


One cycle: approx. 12mS
G8 5
G7 6
G6 7
G5 8
G4 18
G3 19
G2 20
G1 22
h 9
g 10
f 11
e 12
d 13
c 14
b 15
a 16
SA FR WE TU MO SU SA
1g 2g TH 4g 5g 1g
1f 2f 4f 5f START 1f
1e 2e 4e 5e END 1e
1d 2d 4d 5d 1d
1c 2c 4c 5c 1c
1b 2b 4b 5b 1b
1a 2a : 4a 5a TIMER 1a
IN 0 23 RESET MEMORY MIN RESET
IN 1 24 CLEAR CLK/CNTR HOUR CLOCKSET CLEAR
IN 2 25 TIMER OTR DAY PGM NO TIMER
IN 3 26 POWER TIME END TEST CH UP CH DOWN POWER

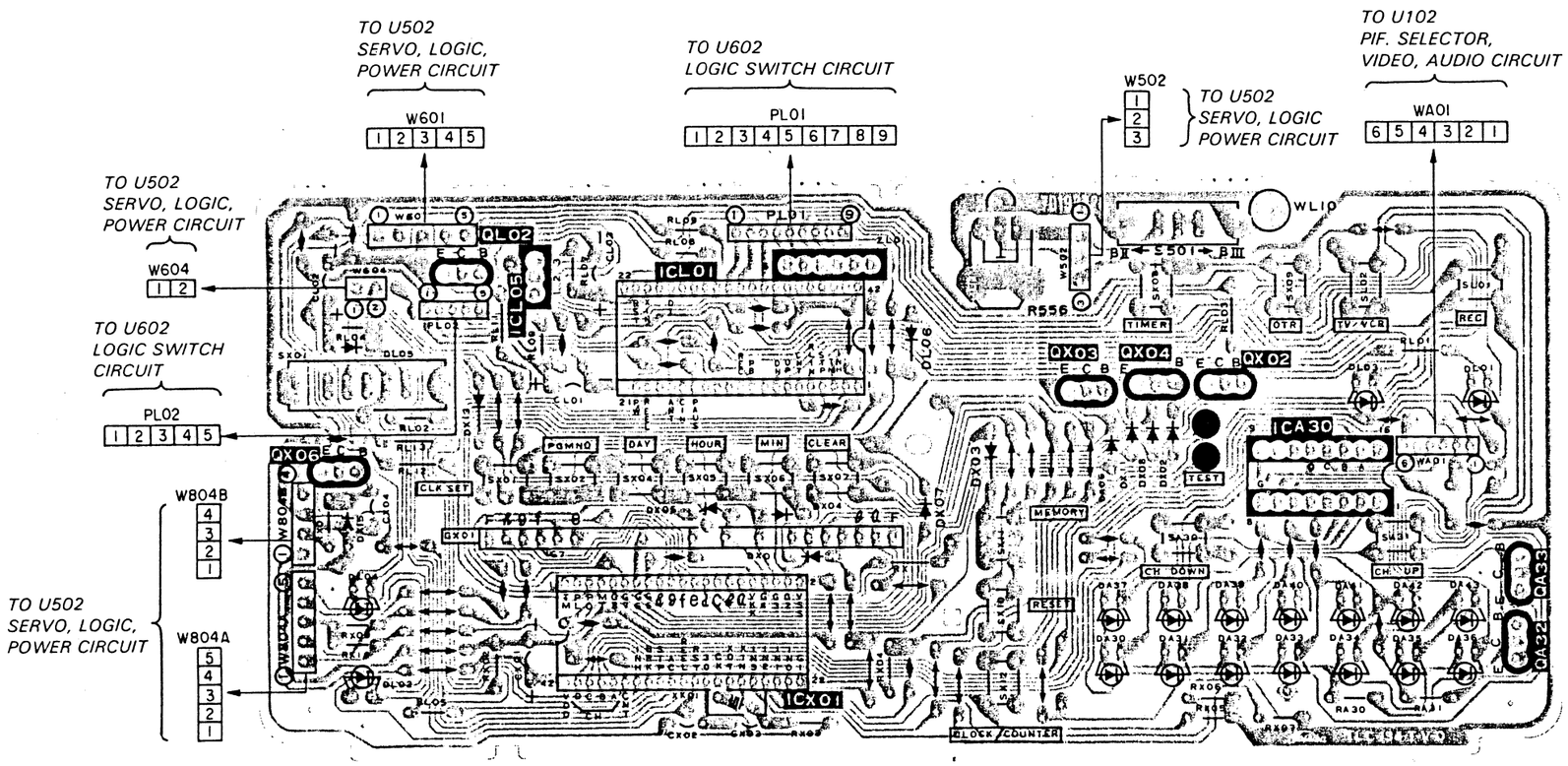
Key Matrix

11. Timer, Channel Selector and Electronic Counter PC Board



Location of Transistor

Symbol No.	Mute ON			Mute OFF			Location
	B	C	E	B	C	E	
QX02	0.0	4.3P	4.3P	4.9	4.3P	4.3P	E-7
QX03	0.0	4.3P	4.3P	4.9	4.3P	4.3P	E-6
QX04	0.0	4.3P	4.3P	4.9	4.3P	4.3P	E-6
QX06	5.7	5.1	5.0	−0.7	5.1	0.0	E-2



VR

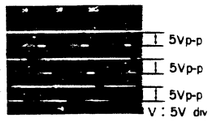
Symbol No.	Description	Name	Location
R556	500K	Tracking VR	D-6

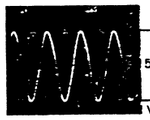
Location of Diodes

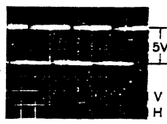
Symbol No.	Location	Symbol No.	Location
DA30	F-6	DL03	E-7
DA31	F-6	DL04	F-2
DA32	F-7	DL05	D-2
DA33	F-7	DL06	D-5
DA34	F-7	DX01	E-5
DA35	F-8	DX02	E-6
DA36	F-8	DX03	E-5
DA37	F-6	DX04	E-4
DA38	F-6	DX05	E-4
DA39	F-7	DX06	E-6
DA40	F-7	DX07	E-5
DA41	F-7	DX08	E-6
DA42	F-8	DX11	E-6
DA43	F-8	DX13	E-3
DL01	E-8	DX15	E-2
DL02	F-2		

12. Timer, Channel Selector and Electronic Counter Circuits

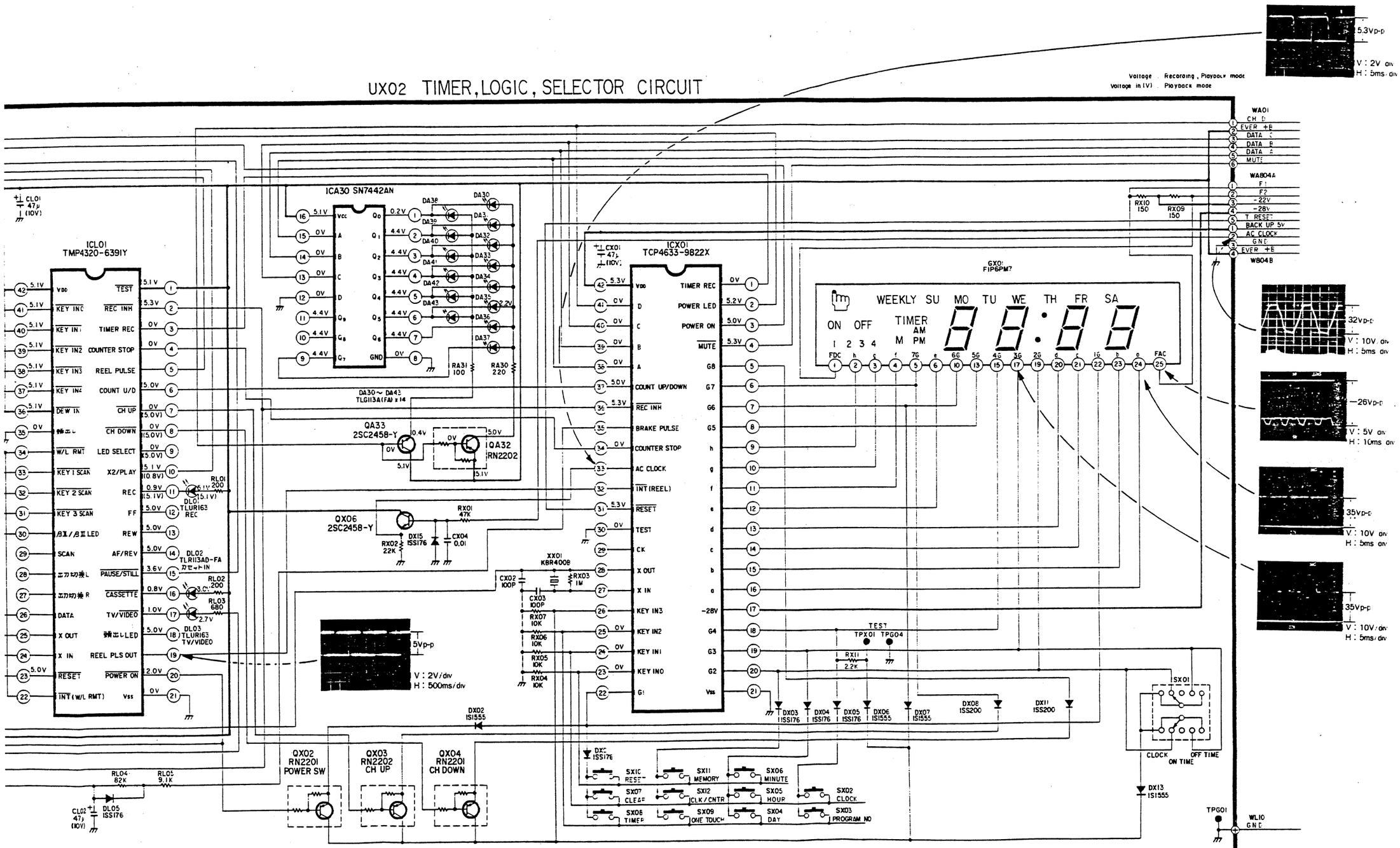
UX02 TIMER, LOGIC, SELECTOR CIRCUIT





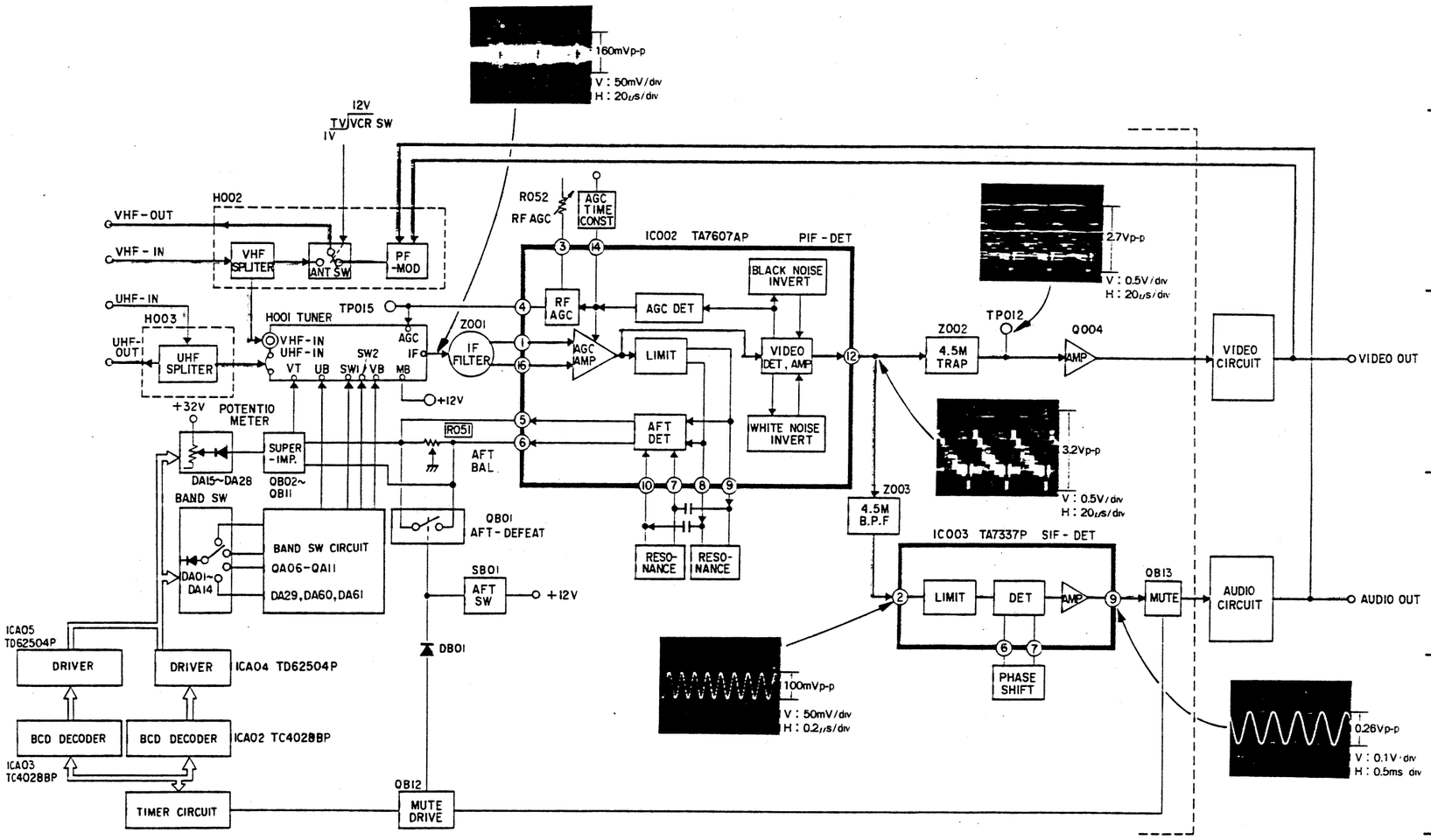


UX02 TIMER, LOGIC, SELECTOR CIRCUIT

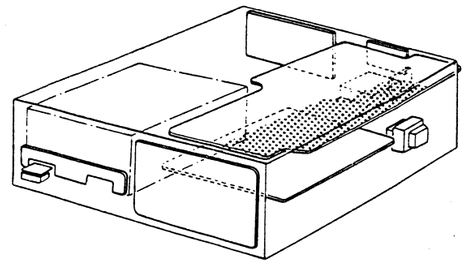


Voltage : Recording, Playback mode
Voltage in (V) : Playback mode

13. PIF and Channel Selector Block Diagrams



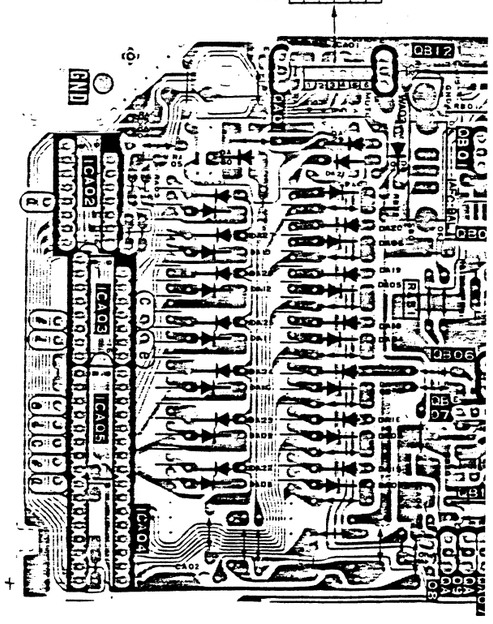
14. PIF and Channel Selector PC Board

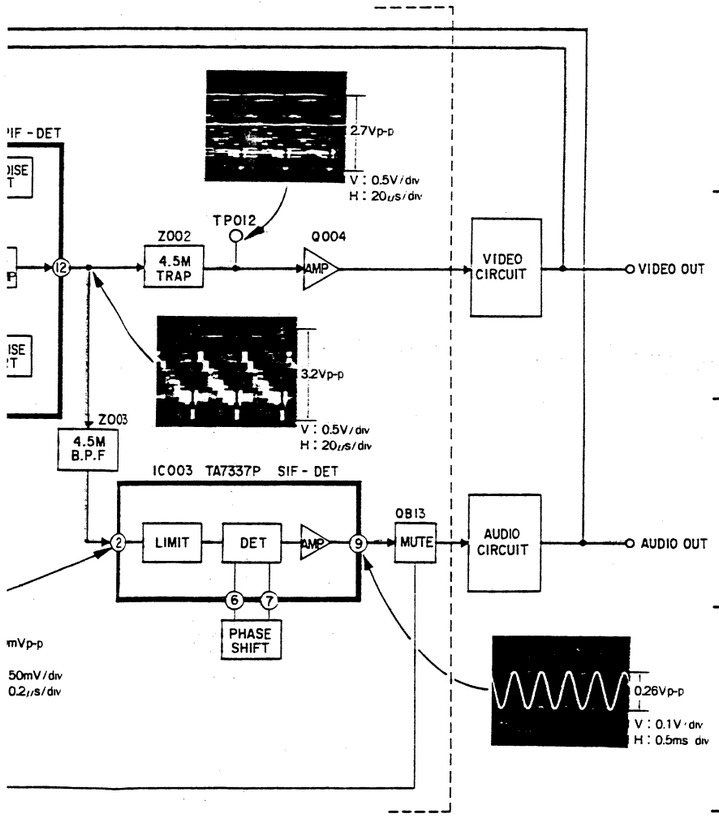


Location of Transist

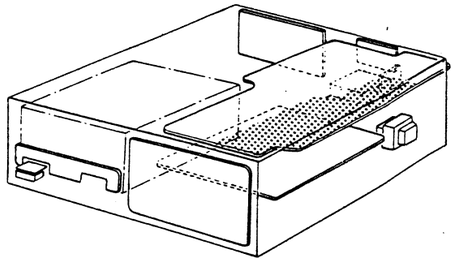
Symbol No.	B
Q001	1.2
Q004	1.9
QA01	0
QA06	11.9
QA07	0 12
QA08	11.9
QA09	0 12
QA10	11.2 11
QA11	11.3
QB03	6.5
QB04	23.8 12
QB05	6.6
QB06	13.1 13
QB07	8.8 13
QB08	8.2
QB09	1.4
QB10	1.2
QB11	0
QB12	3.6
QB13	0

TO UX02 TIMER, LOGIC, SELECTOR CIRCUIT





14. PIF and Channel Selector PC Board



Location of Transistors

Symbol No.	B	C	E	Location
Q001	1.2	7.2	0.5	F-5
Q004	1.9	1.4	1.4	E-5
QA01	0	5.2	0	D-3
QA06	11.9	0	12	G-4
QA07	0	22.5	0	G-4
QA08	11.9	0	12	G-4
QA09	0	24.8	0	G-4
QA10	11.2	11.9	12	G-4
QA11	11.3	0	12	G-4
QB03	6.5	1.4	7.1	E-4
QB04	23.8	20.6	24.5	E-4
QB05	6.6	0	7.2	E-4
QB06	13.1	31.4	12.5	F-4
QB07	8.8	31.4	8.3	F-4
QB08	8.2	0	8.3	F-4
QB09	1.4	8.2	0.7	F-4
QB10	1.2	0.7	0.6	F-4
QB11	0	0.8	0	F-4
QB12	3.6	0	0	D-3
QB13	0	0	0	E-6

Symbol No.	Name	V. B	V. C	V. E	V. B	V. C	V. E	UHF B	UHF C	UHF E	CATV B	CATV C	CATV E
QA06	RN2202	11.9	0	12	0	11.9	12	11.9	0	12	1.4	11.9	12
QA07	RN1202	0	22.5	0	11.9	0	0	0	22.5	0	11.9	0	0
QA08	RN2202	11.9	0	12	11.9	0	12	11.9	0	12	0.7	11.9	12
QA09	RN1202	0	24.8	0	0	24.5	0	0	24.8	0	11.9	0	0
QA10	2SA1048Y	11.2	11.9	12	11.2	11.8	12	11.9	0	12	11.1	11.7	12
QA11	2SA1048Y	11.3	0	12	11.2	0	12	11.2	11.8	12	11.2	0	12
QB10	2SC2458Y	1.2	0.7	0.6	1.3	0.8	0.7	0	0.8	0.2	1.2	0.7	0.7
QB11	2SC2458Y	0	0.8	0	0	1.7	0	0.7	0	0	0	0.9	0

Symbol No.	Name	Mute ON B	Mute ON C	Mute ON E	Mute OFF B	Mute OFF C	Mute OFF E
QB12	RN1202	0	9.2	0	3.6	0	0
QB13	RN1204	9.2	0	0	0	0	0

Symbol No.	Name	AFT ON S	AFT ON G	AFT ON D	AFT OFF S	AFT OFF G	AFT OFF D
QB1		6.1	0	7.0	6.5	7.1	6.6

Symbol No.	S	G	D	Location
QB01	7.1			E-4
QB02	2.8			E-4

Location of Adjusting VRs

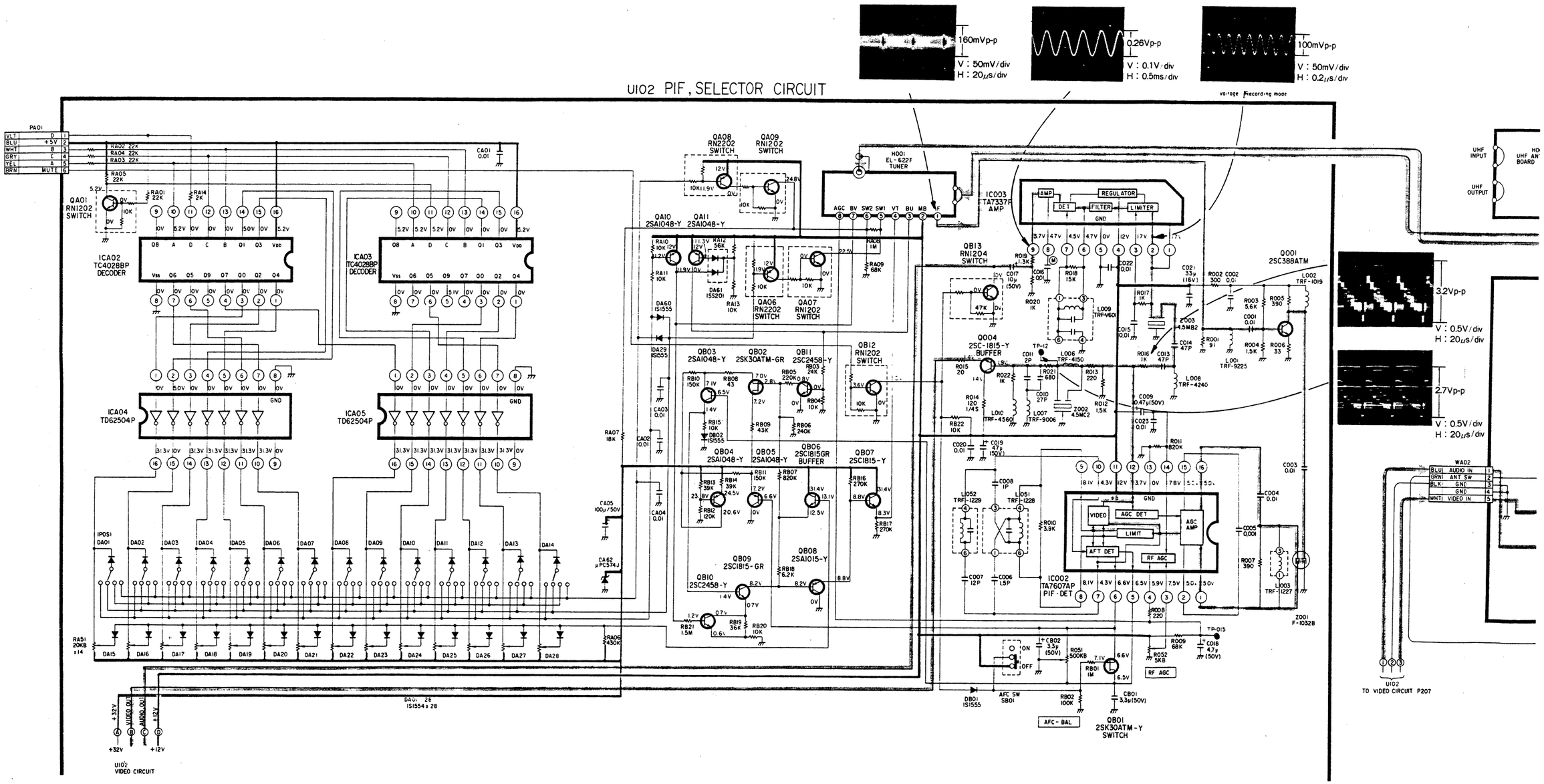
Symbol No.	Location
R051	E-4
R052	F-4

Location of Diodes

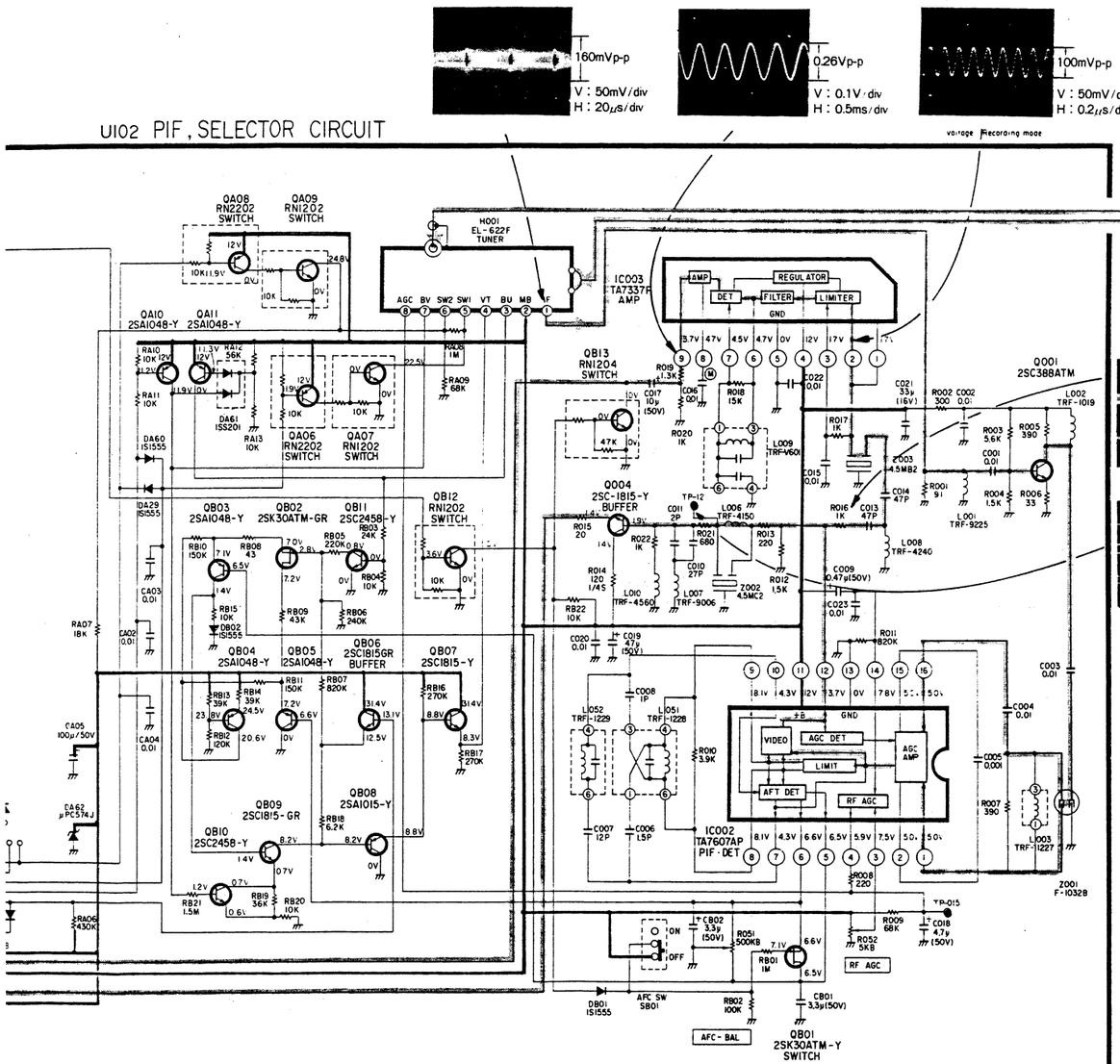
Symbol No.	Location
DA01	F-3
DA02	F-3
DA03	F-3
DA04	F-3
DA05	E-3
DA06	E-3
DA07	E-3
DA08	F-3
DA09	F-3
DA10	F-3
DA11	F-3
DA12	E-3
DA13	E-3
DA14	E-3
DA15	F-3
DA16	F-3
DA17	F-3
DA18	F-3
DA19	E-3
DA20	E-3
DA21	E-3
DA22	F-3
DA23	F-3
DA24	F-3
DA25	E-3
DA26	E-3
DA27	E-3
DA28	E-3
DA29	E-3
DA60	E-3
DA61	G-4
DB01	E-3
DB02	F-4

TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT

15. PIF, Channel Selector, Antenna Switch and RF Modulator Circuits



lator Circuits



(Note 1) R10 Value depends upon ranks of Q01 :

Q01	F10
FA-1(G)	8.2KΩ
FA-2(Y)	6.8KΩ
FA-3(R)	6.2KΩ

(Note2) Unit of fixed resistors is Ohm.

(Note3) Unit of fixed capacitors is PF (unless otherwise noted)
n---(nF) μ---(μF)

(Note4) Resistors and capacitors marked ※ have wire leads
Parts with no mark are of tip type.

16. Mechanism and System Control Block Diagram

Table 1 Reel rotation abnormal detection time

Mode \ Speed	ßII	ßIII
PLAY	2.0 sec.	2.5 sec.
REC	2.0 sec.	2.5 sec.
SLOW	3.0 sec.	
CUE	2.0 sec.	
REVIEW	6.0 sec.	
FF	1.5 sec.	
REW	2.5 sec.	
Unloading	1.3 sec.	

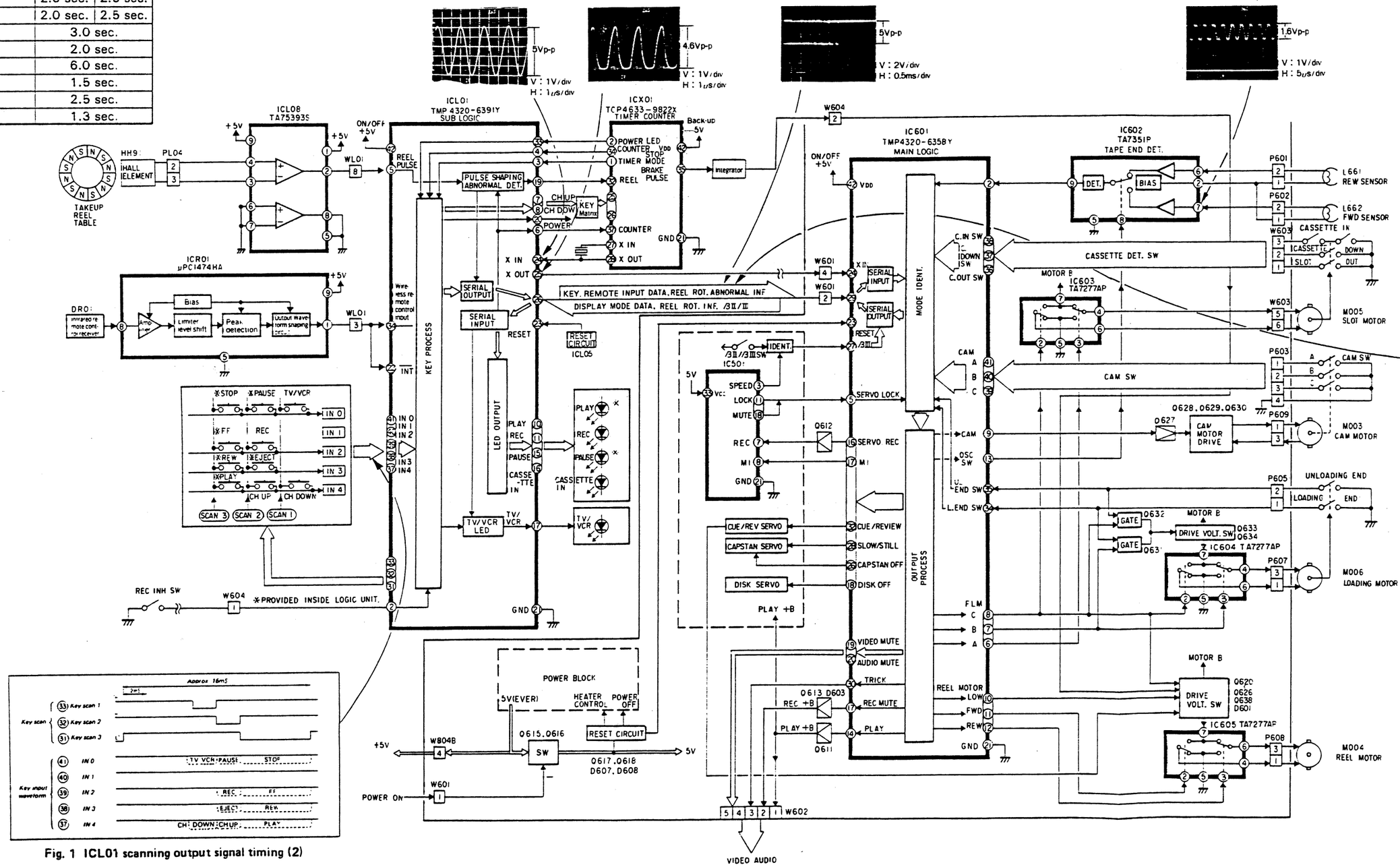


Fig. 1 ICL01 scanning output signal timing (2)

Table 2 Mc

Input / Current mode
Cassette open & not out
Slot in
Loading
Unloading
Stop
FF
REW
CUE
REVIEW
PLAY
STILL
REC
REC PAUSE
Timer Rec.

Table 3 Se

sub ⟹

Main

Sub

Status

Mai

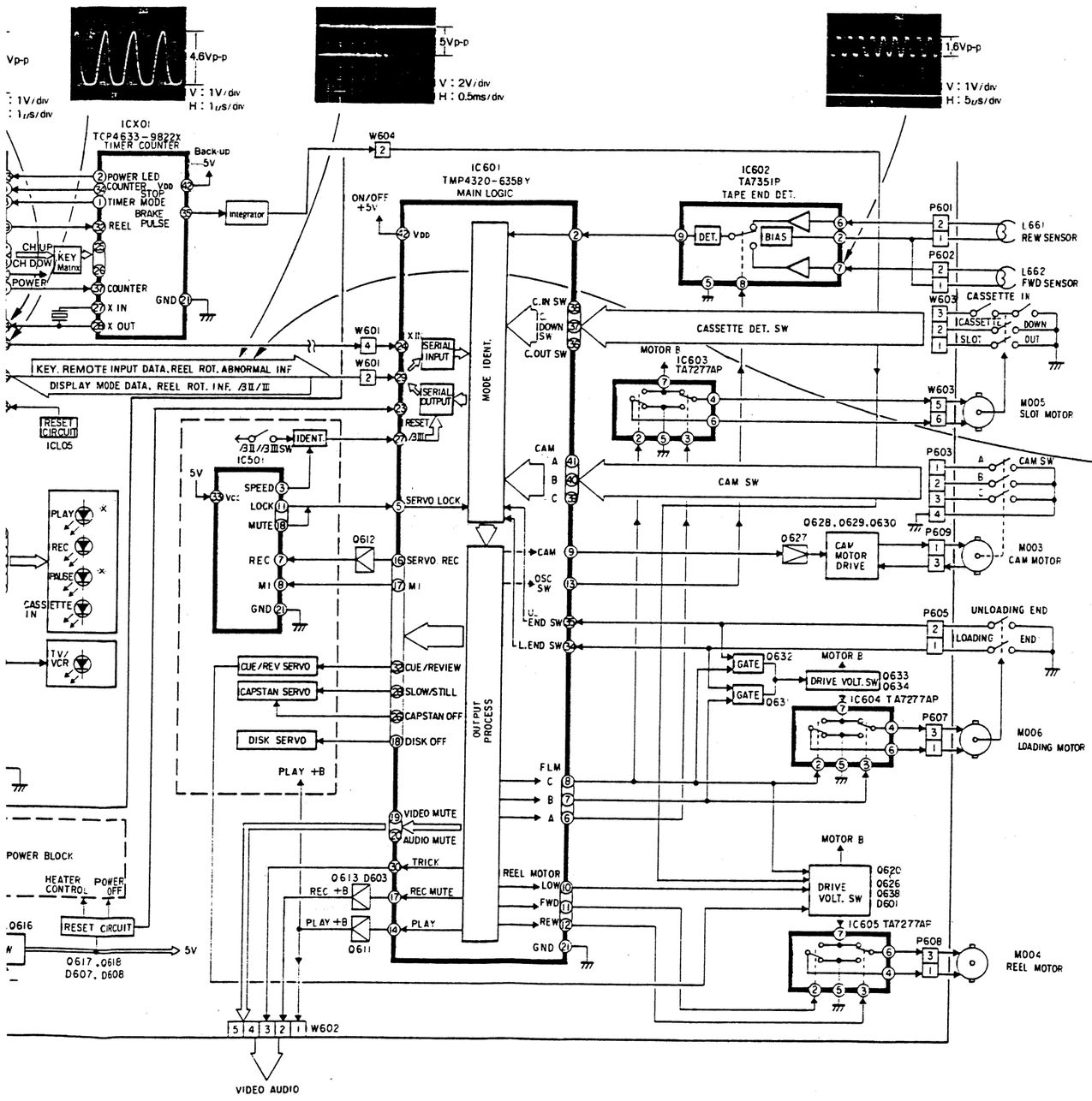


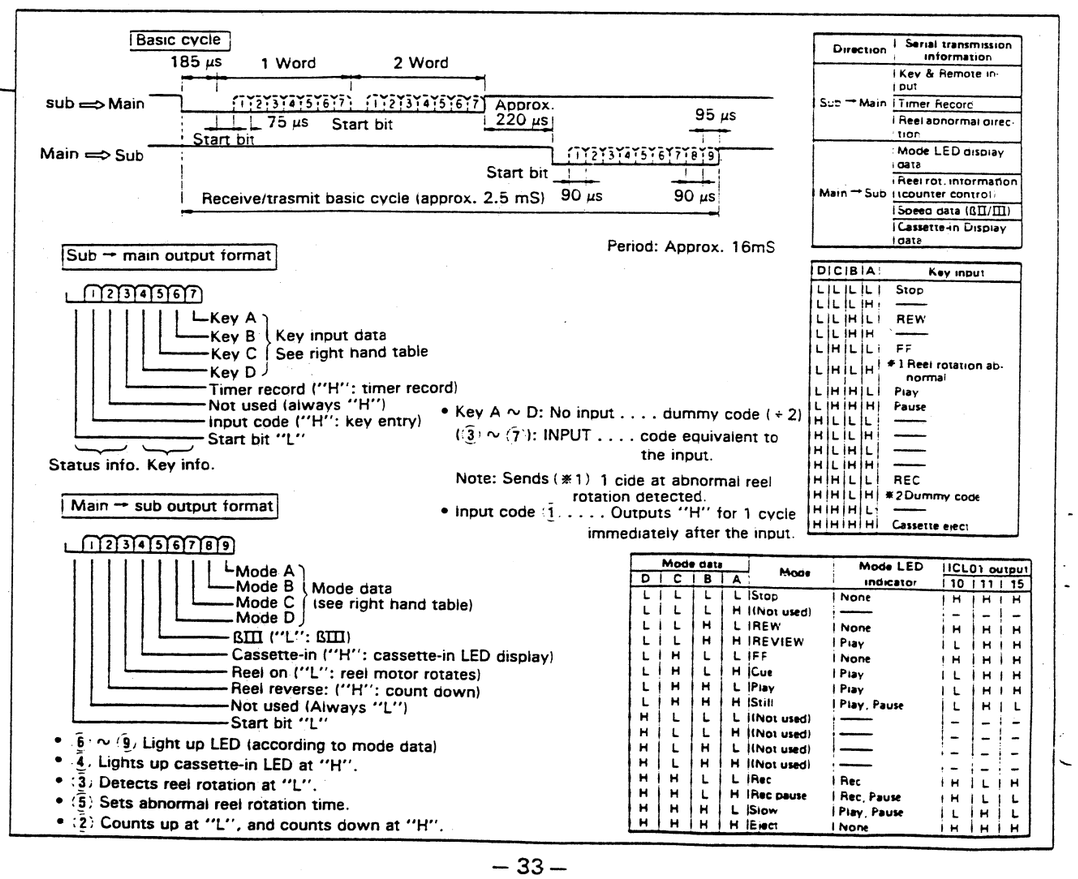
Table 2 Mode shift table

Input / Current mode	Cassette eject	Stop	FF	REW	PLAY	PAUSE	REC	One touch timer	Abnormal detection: Tape end detection	Abnormal detection: Reel rotation abnormal detection
Cassette open & eject out	x	x	x	x	x	x	x	x	x	x
Stop-up	○	△	△	–	–	x	x	x	x	x
Loading	x	△	△	–	–	x	–	–	x	x
Unloading	x	x	x	x	x	x	x	x	x	Motor stop
Stop	○	–	○	○	○	x	○	○	x	x
FF	○	○	○ Cue	○	○	x	x	○	Rewind	Stop
REW	○	○	○	○ Review	○	x	x	○	Stop	Stop
CUE	○	○	○	○ Review	○	x	x	○	Rewind	Stop
REVIEW	○	○	○ Cue	○	○	x	x	○	Stop	Stop
PLAY	○	○	○ Cue	○ Review	–	○ Still	x	○	Rewind	Stop
STILL	○	○	○ Cue	○ Review	* ○ Slow	○ Play	○ Rec pause after reversed / –	○	Rewind	x
REC	x	○ after reversed	x	x	x	○ Rec pause after reversed	–	–	Rewind	Stop (After reversed)
REC PAUSE	x	○	x	x	x	Rec	x	○	Rewind	x
Timer Rec.	x	x	x	x	x	x	x	–	Stop	Stop (After reversed)

○ . . . . Shift directly to mode specified.
– . . . . Shift to mode specified after completion of loading.
x . . . . Not accept.

(Note)
* . . . . Slow mode as long as PLAY button is being pushed.

Table 3 Serial data transmission format


Basic cycle
185 μs
1 Word
2 Word
sub ⇒ Main
Main ⇒ Sub
75 μs
Start bit
Approx. 220 μs
95 μs
90 μs
Receive/trasmit basic cycle (approx. 2.5 mS)
Period: Approx. 16mS
Sub → main output format
Key A
Key B
Key C
Key D
Key input data
See right hand table
Timer record ("H": timer record)
Not used (always "H")
Input code ("H": key entry)
Start bit "L"
Status info. Key info.
• Key A ~ D: No input . . . . dummy code (÷2)
(3) ~ (7): INPUT . . . . code equivalent to the input.
Note: Sends (*1) 1 cide at abnormal reel rotation detected.
• Input code (1) . . . . Outputs "H" for 1 cycle immediately after the input.
Main → sub output format
Mode A
Mode B
Mode C
Mode D
Mode data (see right hand table)
ßIII ("L": ßIII)
Cassette-in ("H": cassette-in LED display)
Reel on ("L": reel motor rotates)
Reel reverse: ("H": count down)
Not used (Always "L")
Start bit "L"
• (6) ~ (9) Light up LED (according to mode data)
• (4) Lights up cassette-in LED at "H".
• (3) Detects reel rotation at "L".
• (5) Sets abnormal reel rotation time.
• (2) Counts up at "L", and counts down at "H".

Direction	Serial transmission information
Sub → Main	Key & Remote input
	Timer Record
	Reel abnormal direction
Main → Sub	Mode LED display data
	Reel rot. information (counter control)
	Speed data (6II/III)
	Cassette-in Display data

D	C	B	A	Key input
L	L	L	L	Stop
L	L	L	H	——
L	L	H	L	REW
L	L	H	H	——
L	H	L	L	FF
L	H	L	H	*1 Reel rotation abnormal
L	H	H	L	Play
L	H	H	H	Pause
H	L	L	L	——
H	L	L	H	——
H	L	H	L	——
H	L	H	H	——
H	H	L	L	REC
H	H	L	H	*2 Dummy code
H	H	H	L	——
H	H	H	H	Cassette eject

Mode data D	C	B	A	Mode	Mode LED indicator	IC101 output 10	11	15
L	L	L	L	Stop	None	H	H	H
L	L	L	H	(Not used)	——	–	–	–
L	L	H	L	REW	None	H	H	H
L	L	H	H	REVIEW	Play	L	H	H
L	H	L	L	FF	None	H	H	H
L	H	L	H	Cue	Play	L	H	H
L	H	H	L	Play	Play	L	H	H
L	H	H	H	Still	Play, Pause	L	H	L
H	L	L	L	(Not used)	——	–	–	–
H	L	L	H	(Not used)	——	–	–	–
H	L	H	L	(Not used)	——	–	–	–
H	L	H	H	(Not used)	——	–	–	–
H	H	L	L	Rec	Rec	H	L	H
H	H	L	H	Rec pause	Rec, Pause	H	L	L
H	H	H	L	Slow	Play, Pause	L	H	L
H	H	H	H	Eject	None	H	H	H

Logic Microcomputer

Logic Main Microcomputer (TMP4320-6358Y)

Mode	A	B	C
Motor off	H	H	H
Slot-in	L	H	H
Slot-out	H	L	L
Loading	H	L	H
Unloading	L	H	L

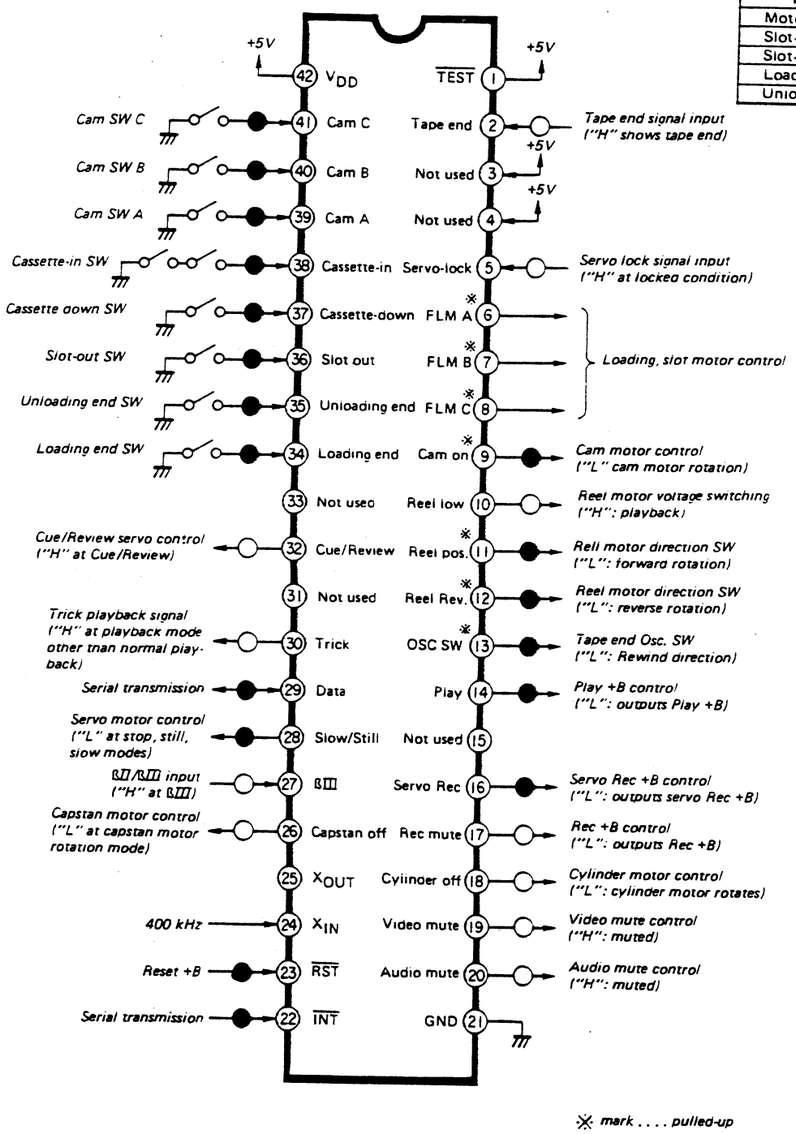


Fig. 3 Functions of terminals, TMP4320-6358Y

Table 4 IC601 (TMP4320-6358Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec Pause	Re-verse
6	FLM A	L	H	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H
7	FLM B	L	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H
8	FLM C	L	H	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H
9	Cam On	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H
10	Reel low	H	L	L	L	L	L	L	L	L	L	L	*H	*H	*H	*H	L	L
11	Reel pos.	L	H	H	H	H	L	H	L	H	L	H	H	H	H	H	H	H
12	Reel rev.	L	H	H	H	H	H	H	H	L	H	L	L	L	L	L	H	⊓⊓
13	Osc sw.	L	H	H	H	H	H	H	H	L	H	L	H	H	H	H	L	L
14	Play	L	H	H	H	H	H	H	H	H	L	L	L	L	L	H	H	H
15	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
16	Servo Rec	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
17	Rec mute	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	L	L
18	Cylinder off	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L
19	Video mute	H	L	L	L	L	L	L	L	L	L	L	※⊓	L	L	L	L	L
20	Audio mute	H	L	L	L	L	L	L	L	L	H	H	※⊓	H	H	L	L	L
33	Not used	H	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	H
32	Cue/Review	H	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L
31	Not used	H	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L
30	Trick	H	L	L	L	L	L	L	L	L	H	H	L	H	H	L	L	L
28	Still·Slow	L	L	L	L	L	L	L	H	H	H	H	H	L	L	H	H	L
26	Capstan Off	H	H	H	H	H	H	H	H	H	H	H	L	H	⊓⊓	L	L	H
39	Cam A	–	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L
40	Cam B	–	H	H	H	L	H	H	L	L	L	L	L	L	L	L	H	L
41	Cam C	–	L	L	L	H	H	L	H	H	H	H	L	L	L	L	L	H
Cam position		–	III	III	III	II	I	III	II	II	II	II	IV	IV	IV	IV	III	II

NOTE : *H=0.7V, ※ pin 5 input ("H" at servo Lock "L")

Table 5 ICL01(TMP4320-6391Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec Pause	Note
6	Count up	H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	"L" during reverse.
7	CH up	L	•	•	•	•	•	•	•	•	•	•	•	•	L	•	•	•: "L" with CH-up button being pushed.
8	CH down	L	•	•	•	•	•	•	•	•	•	•	•	•	L	•	•	•: "L" with CH-Dn button being pushed.
9	LED select	H	H	H	L	H	L	H	H	H	H	H	H	H	L	L		
10	Play LED	L	H	△	H	△	H	H	H	H	H	H	H	H	L	L		△: "L" in Play mode.
11	Rec LED	L	H	H	H	△	H	H	H	H	H	H	H	H	L	L		△: "L" in Rec mode.
12	Not used	L	H	–	H	△	H	H	L	H	L	H	H	H	H	H		△: "L" in FF/Cue mode.
13	Not used	L	H	–	L	△	L	H	H		H	L	H	H	H	H		△: "L" in REW/Review mode.
14	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
15	Pause LED	L	H	△	H	△	H	H	H	H	H	H	H	H	H	L		△: "L" in Still, Rec pause mode.
16	Cassette-in LED	L	H	⊓⊓	⊓⊓	⊓⊓	⊓⊓	L	L	L	L	L	L	L	H	L		
17	Antenna LED	L	*	*	*	*	*	*	*	*	*□	*□	*□	*□	*	*		*: Output reversed when TV/VCR button is pushed. □: "L" during mode shift.
18	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
20	POWER ON/OFF	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H		
																		★
Lights up LED	Play	–		–		△					○	○	○	○				○: Light-up
	Pause	–		△		△							○	○				
	Rec	–				△								○				△: Light-up depending mode.
	Cassette-in	–		Blinks	Blinks	Blinks	Blinks	○	○	○	○	○	○	○	○	○	○	

NOTE : ★"L" Output when wireless power button is pushed.

A	B	C
H	H	H
L	H	H
H	L	L
H	L	H
L	H	L

Table 4 IC601 (TMP4320-6358Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec pause	Re-verse
6	FLM A	L	H	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H
7	FLM B	L	H	H	L	L	H	H	H	H	H	H	H	H	H	H	H	H
8	FLM C	L	H	H	L	H	L	H	H	H	H	H	H	H	H	H	H	H
9	Cam On	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H	*H
10	Reel low	H	L	L	L	L	L	L	L	L	L	L	*H	*H	*H	*H	L	L
11	Reel pos.	L	H	H	H	H	L	H	L	H	L	H	H	H	H	H	H	H
12	Reel rev.	L	H	H	H	H	H	H	H	L	H	L	L	L	L	L	H	⊓⊓⊓
13	Osc sw.	L	H	H	H	H	H	H	H	L	H	L	H	H	H	H	H	L
14	Play	L	H	H	H	H	H	H	H	H	L	L	L	L	L	H	H	H
15	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
16	Servo Rec	L	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L
17	Rec mute	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H
18	Cylinder off	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L
19	Video mute	H	L	L	L	L	L	L	L	L	L	L	*⊓	L	L	L	L	L
20	Audio mute	H	L	L	L	L	L	L	L	L	H	H	*⊓	H	H	L	L	L
33	Not used	H	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	H
32	Cue/Review	H	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L
31	Not used	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
30	Trick	H	L	L	L	L	L	L	L	L	H	H	L	H	H	L	L	L
28	Still·Slow	L	L	L	L	L	L	L	H	H	H	H	H	L	L	H	H	L
26	Capstan Off	H	H	H	H	H	H	H	H	H	H	H	L	H	⊓⊓⊓	L	L	H
39	Cam A	–	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
40	Cam B	–	H	H	H	L	H	H	L	L	L	L	L	L	L	L	H	L
41	Cam C	–	L	L	L	H	H	L	H	H	H	H	L	L	L	L	L	H
	Cam position	–	III	III	III	II	I	III	II	II	II	II	IV	IV	IV	IV	III	II

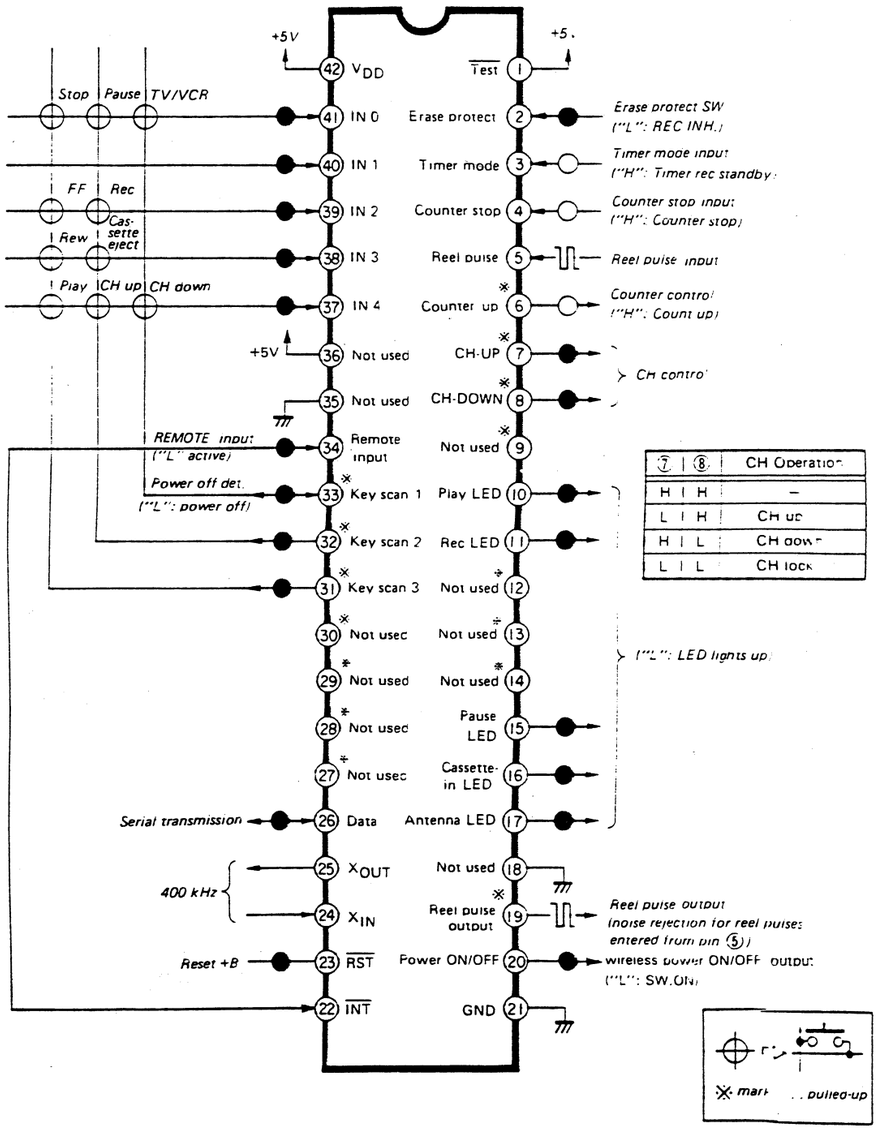
NOTE : *H=0.7V, ※ pin 5 input ("H" at servo Lock "L")

Table 5 ICL01(TMP4320-6391Y) Output logic levels

Pin No.	Name	Active	Cassette empty	Slot-in	Slot-out	Loading	Un-loading	Stop	FF	REW	Cue	Review	Play	Still	Slow	Rec	Rec Pause	Note
6	Count up	H	H	H	H	L	H	H	H	L	H	L	H	H	H	H	H	"L" during reverse.
7	CH up	L	•	•	•	•	•	•	•	•	•	•	•	•	•	L	•	• : "L" with CH-up button being pushed.
8	CH down	L	•	•	•	•	•	•	•	•	•	•	•	•	•	L	•	• : "L" with CH-Dn button being pushed.
9	LED select	H	H	H	L	H	L	H	H	H	H	H	H	H	H	L	L	
10	Play LED	L	H	△	H	△	H	H	H	H	L	L	L	L	L	H	H	△ : "L" in Play mode.
11	Rec LED	L	H	H	H	△	H	H	H	H	H	H	H	H	H	L	L	△ : "L" in Rec mode.
12	Not used	L	H	△	H	△	H	H	L	H	L	H	H	H	H	H	H	△ : "L" in FF/Cue mode
13	Not used	L	H	△	L	△	L	H	H		H	L	H	H	H	H	H	△ : "L" in REW/Review mode.
14	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
15	Pause LED	L	H	△	H	△	H	H	H	H	H	H	H	L	L	H	L	△ : "L" in Still, Rec pause mode
16	Cassette-in LED	L	H	⊓⊓	⊓⊓	⊓⊓	⊓⊓	L	L	L	L	L	L	L	L	L	L	
17	Antenna LED	L	*	*	*	*	*	*	*	*	*□	*□	*□	*□	*	*	*	※ : Output reversed when TV/VCR button is pushed. □ : "L" during mode shift
18	Not used	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
20	POWER ON/OFF	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	★
Lights up LED	Play	–		–		△					○		○	○	○			○ : Light-up
	Pause	–		△		△								○	○			
	Rec	–				△										○	○	△ : Light-up depending mode.
	Cassette-in	–		Blinks	Blinks	Blinks	Blinks	○	○	○	○	○	○	○	○	○	○	

NOTE : ★"L" Output when wireless power button is pushed.

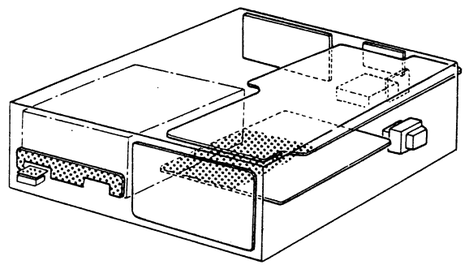
Logic Sub-microcomputer (TMP4320-6391Y)

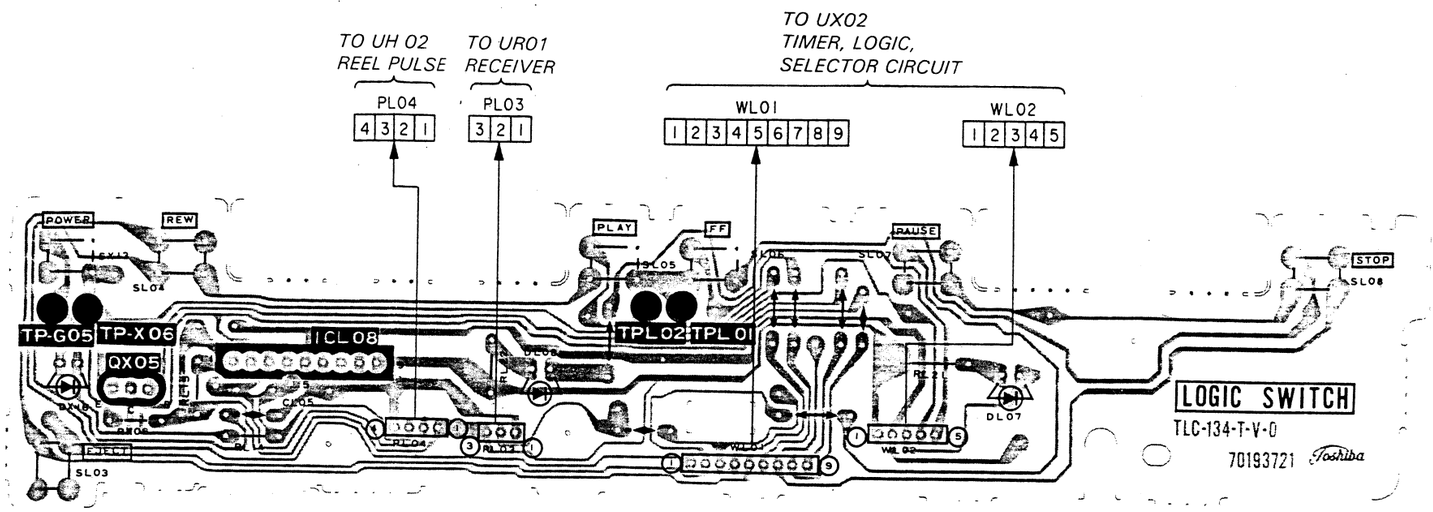


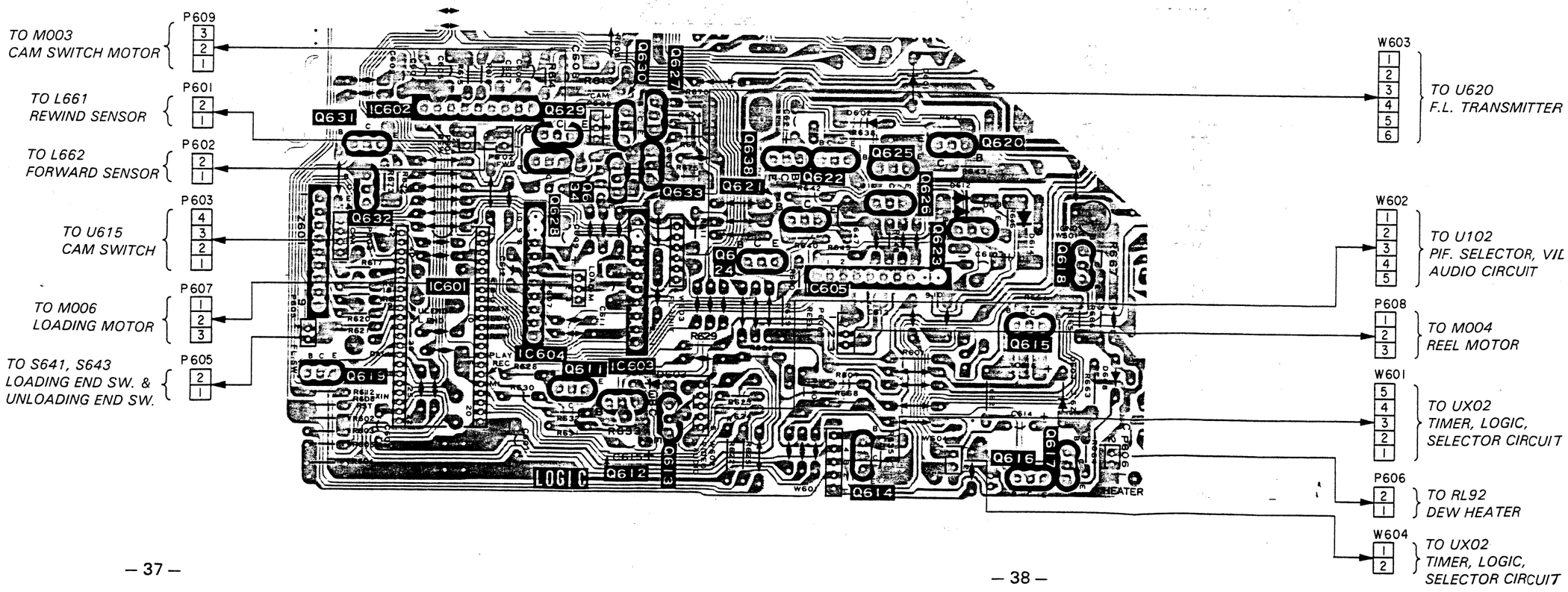
⑦	⑧	CH Operation
H	H	–
L	H	CH up
H	L	CH down
L	L	CH lock

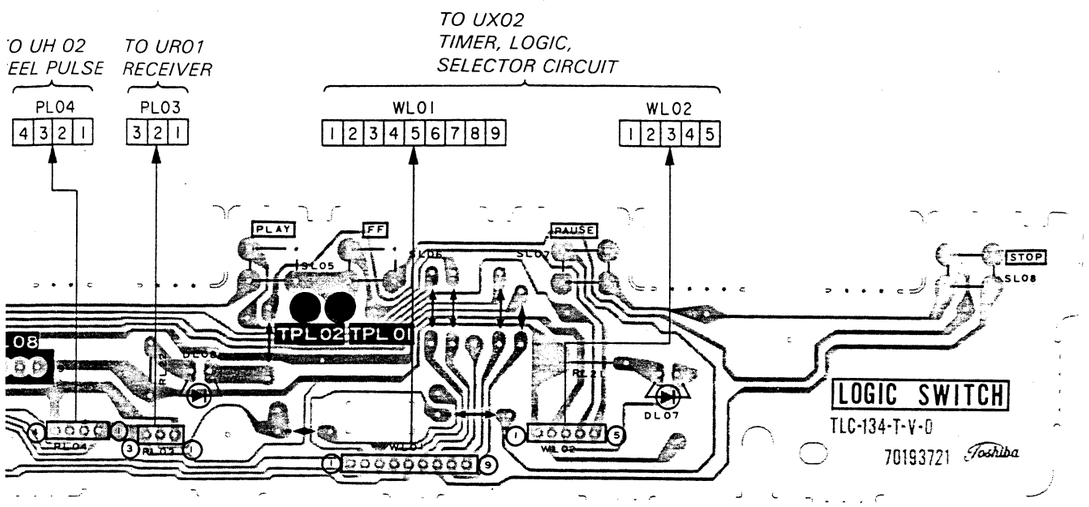
Fig. 4 Function of terminals, TMP4320-6391Y

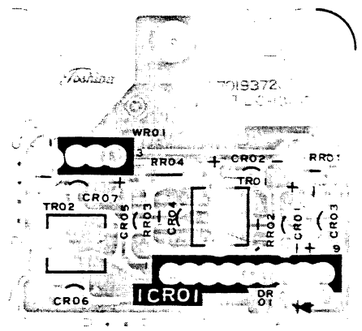
17. Logic PC Board

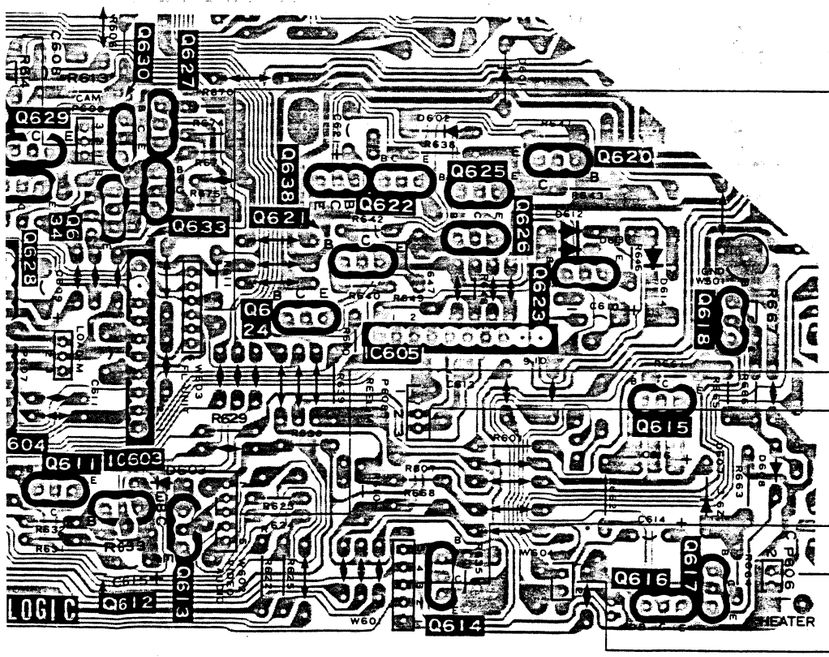












W603
- 1
- 2
- 3
- 4
- 5
- 6

TO U620
F.L. TRANSMITTER

W602
- 1
- 2
- 3
- 4
- 5

TO U102
PIF. SELECTOR, VIDEO,
AUDIO CIRCUIT

P608
- 1
- 2
- 3

TO M004
REEL MOTOR

W601
- 5
- 4
- 3
- 2
- 1

TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT

P606
- 2
- 1

TO RL92
DEW HEATER

W604
- 1
- 2

TO UX02
TIMER, LOGIC,
SELECTOR CIRCUIT

1. Logic SW circuit

V : Rec mode
(V) : Play mode

Location of Digital Transistors

Symbol No.	Location
QX05	C-4
QL08	B-5

Location of Diodes

Symbol No.	Location
DX16	C-4
DL07	C-9
DL08	C-6

Voltage

Symbol No.	B	C	E
QX05	5.1	0.1	0
QL02	5.0	4.9	4.8

2. Main logic circuit

Location of ICs

Symbol No.	Location
IC601	F-5
IC602	E-5
IC603	F-6
IC604	F-5
IC605	F-7

Location of Diodes

Symbol No.	Location
D601	E-8
D602	E-8
D603	G-6
D607	G-9
D608	G-9
D612	E-8
D613	E-8
D614	E-8

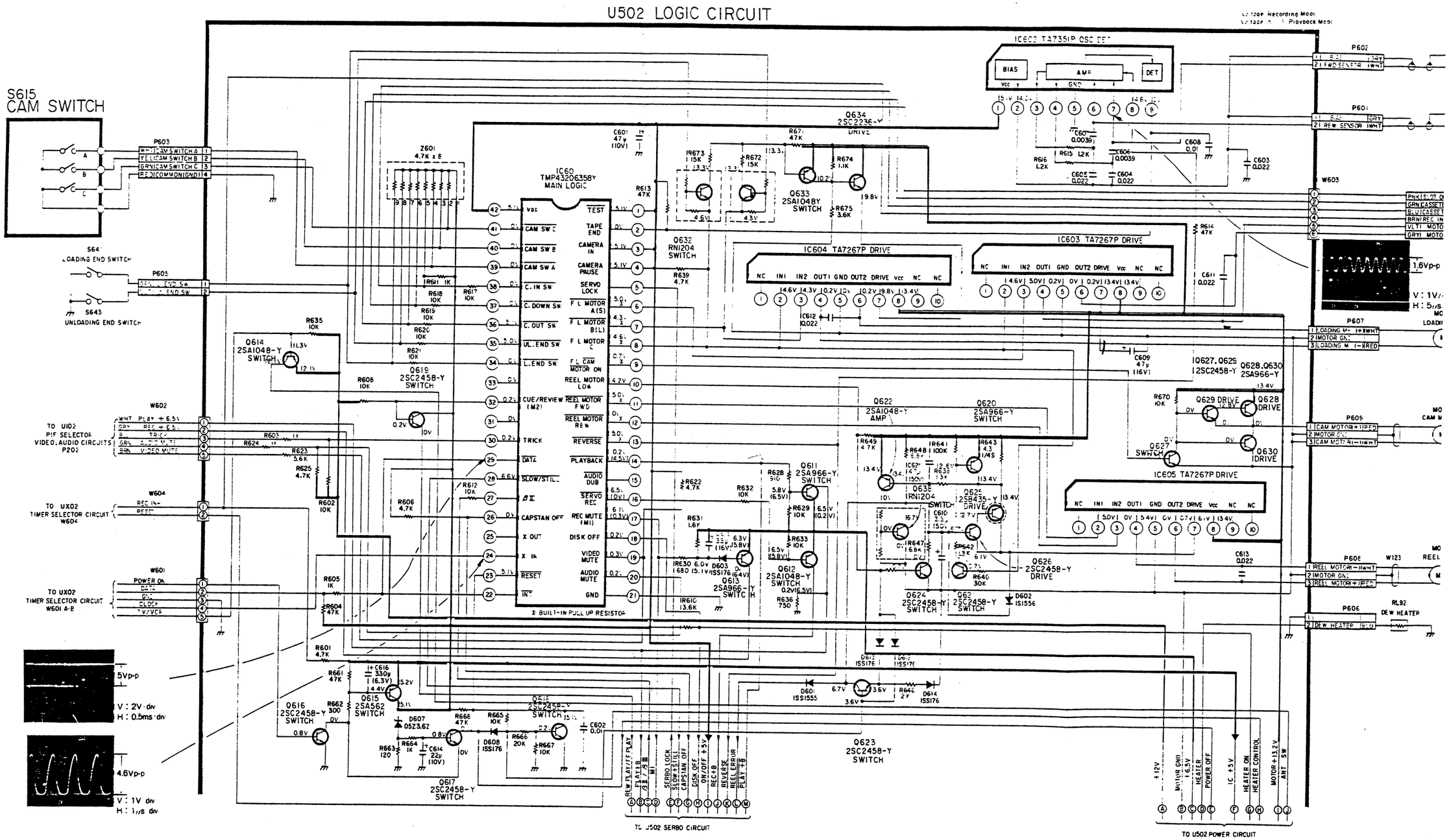
Location of Transistors

Symbol No.	Location
Q611	G-6
Q612	G-6
Q613	G-6
Q614	G-8
Q615	F-9
Q616	G-9
Q617	G-9
Q618	F-9
Q619	F-4
Q620	E-8
Q621	F-7
Q622	E-7
Q623	F-8
Q624	F-7
Q625	E-8
Q626	E-8
Q627	E-6
Q628	E-5
Q629	E-5
Q630	E-6
Q631	E-4
Q632	E-4
Q633	E-6
Q634	E-6
Q638	E-7

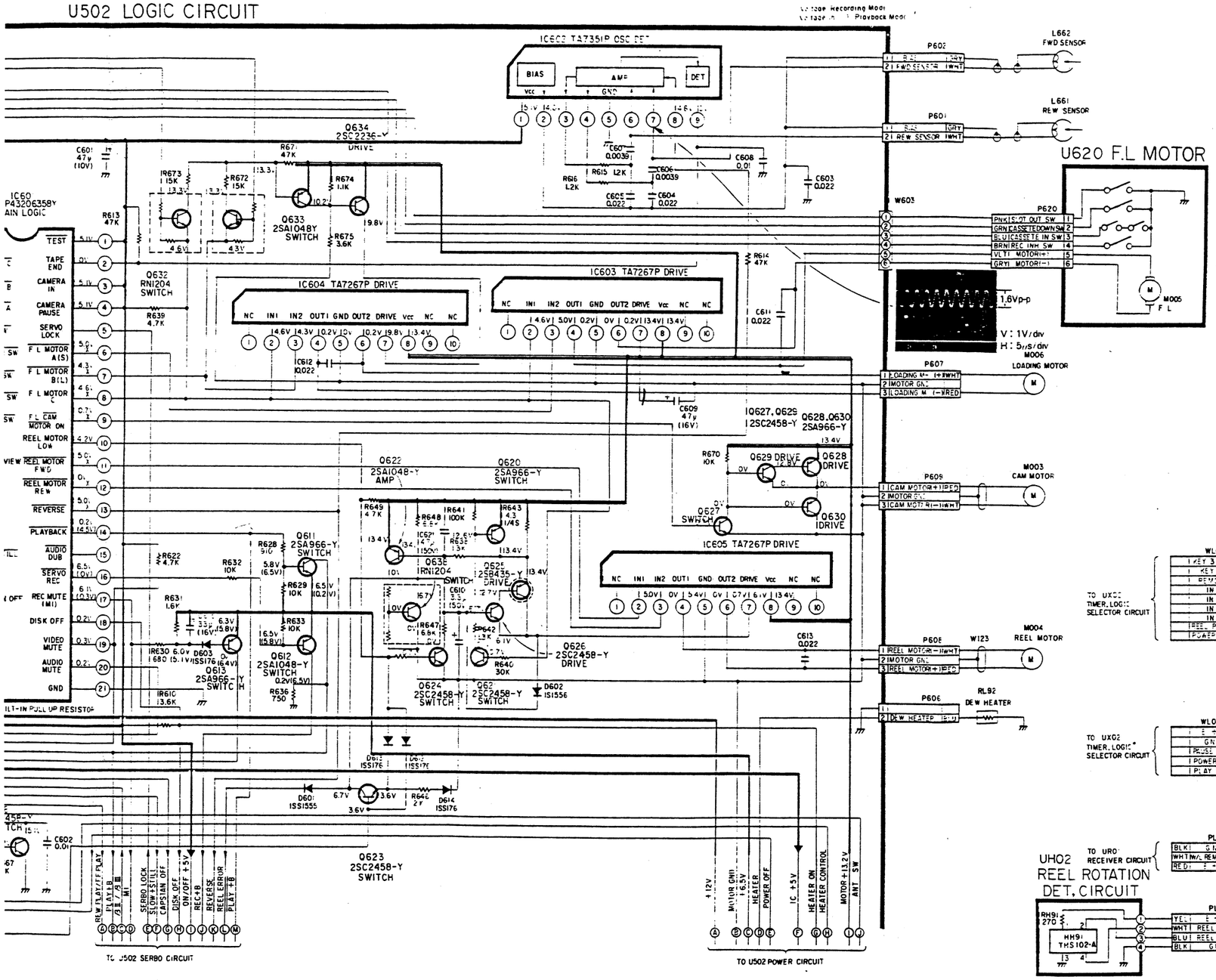
Voltage

	B	C	E
Q611	5.8 (6.5)	6.5 (0.2	6.5
Q612	6.5 (5.8)	0.2 (6.5	6.5
Q613	6.3V (5.8)	0 (6.4	6.5
Q614	11.3	12.1	12.1
Q615	4.4	5.1	5.2
Q616	0.8	0.1	0
Q617	0.8	0	0
Q618	0.2	5.1	0
Q619	0.2	5.1	0
Q620	12.6	13.4	13.4
Q621	0.7	0.1	0
Q622	13.4	0	13.4
Q623	3.6	6.7	3.6
Q624	0.7	0	0
Q625	12.7	6.1	13.4
Q626	6.7	12.7	6.1
Q627	0.7	0	0
Q628	12.8	0	13.4
Q629	0	12.8	0
Q630	0	0	0
Q631	0	13.3	4.3
Q632	5.0	13.3	4.6
Q633	13.3	10.2	13.4
Q634	10.2	13.4	9.8
Q638	0	6.7	0

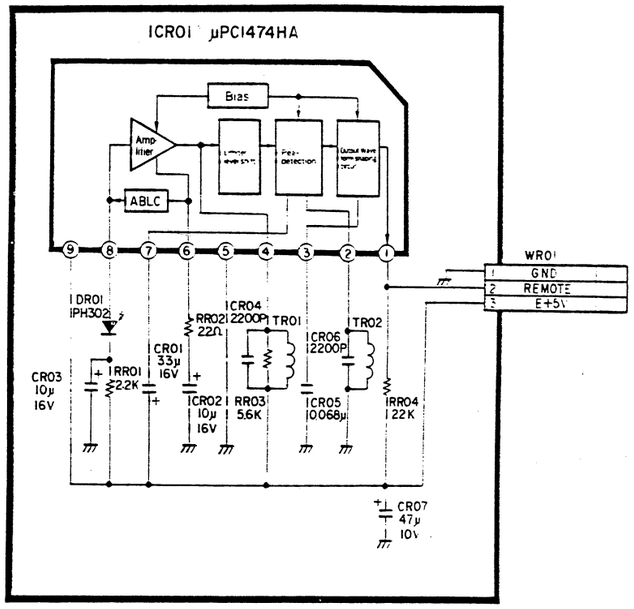
18. Logic Circuit



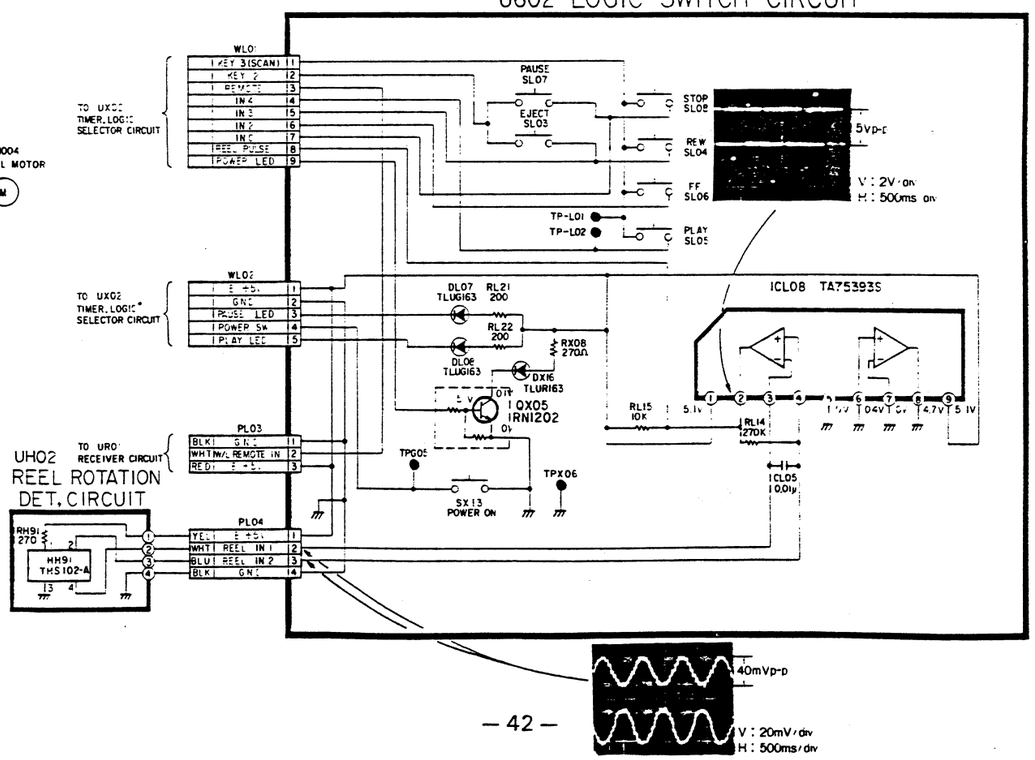
U502 LOGIC CIRCUIT



Remote Control Transmission Circuit

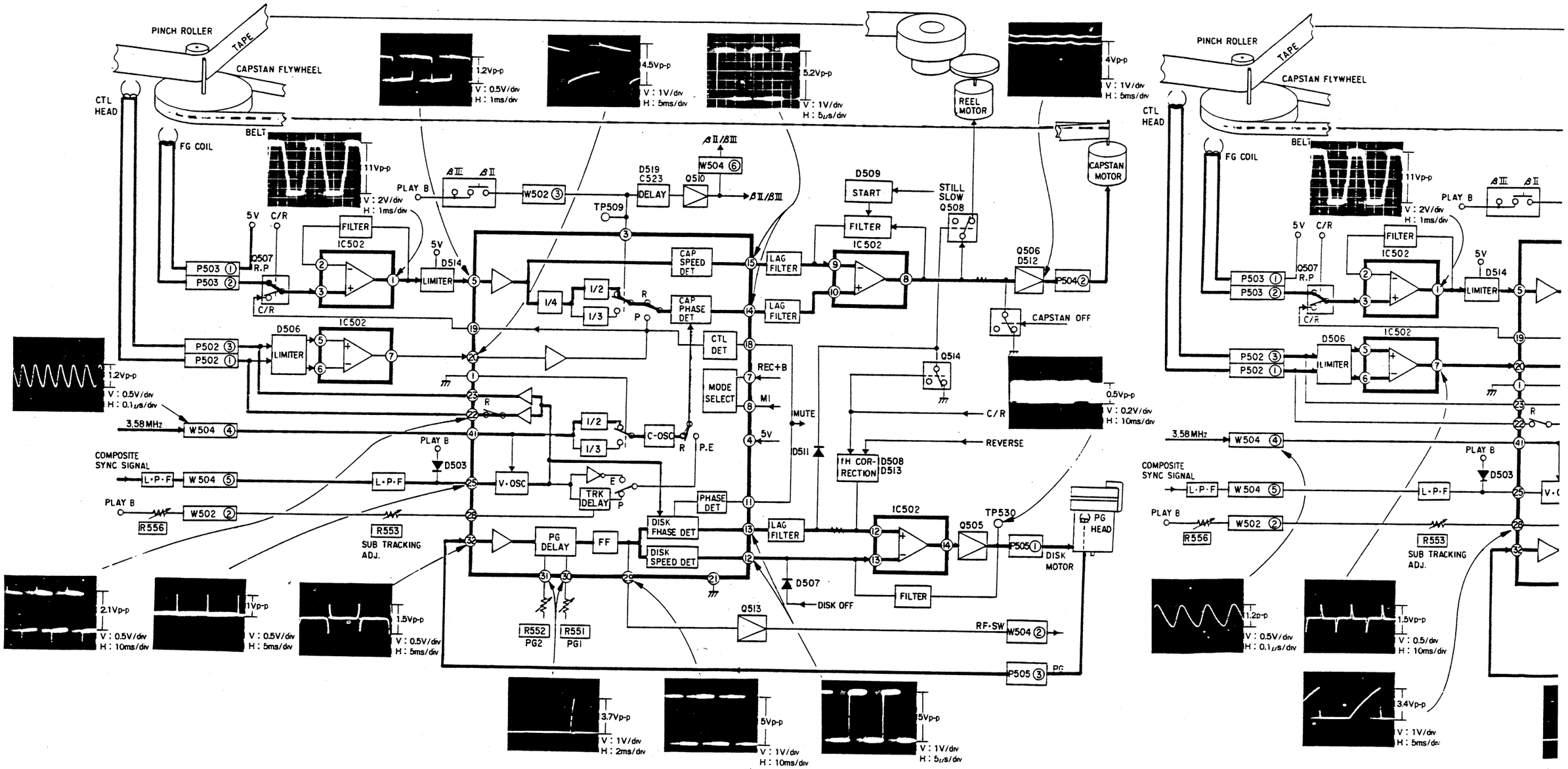


U602 LOGIC SWITCH CIRCUIT

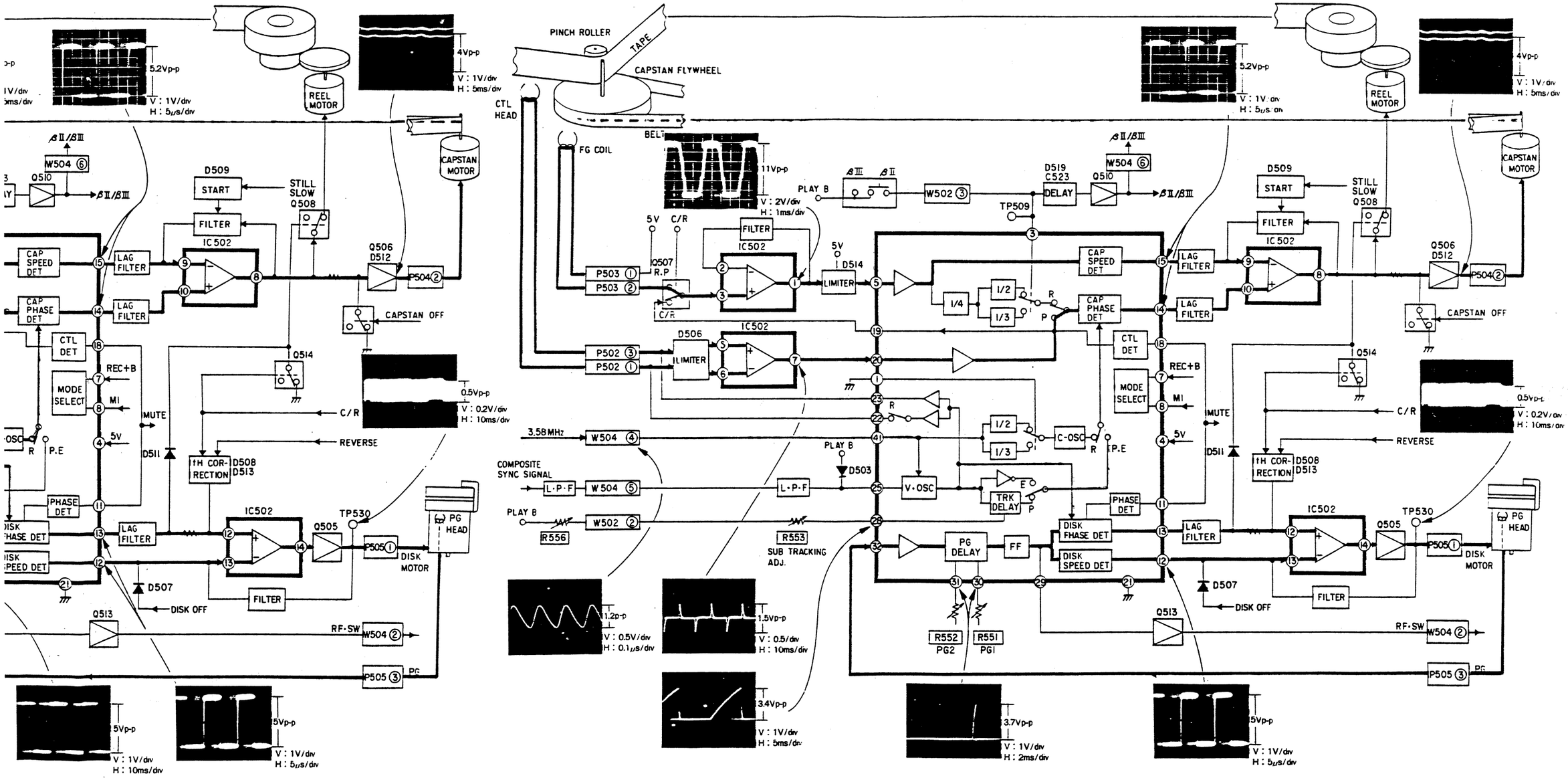


19. Servo Block Diagram

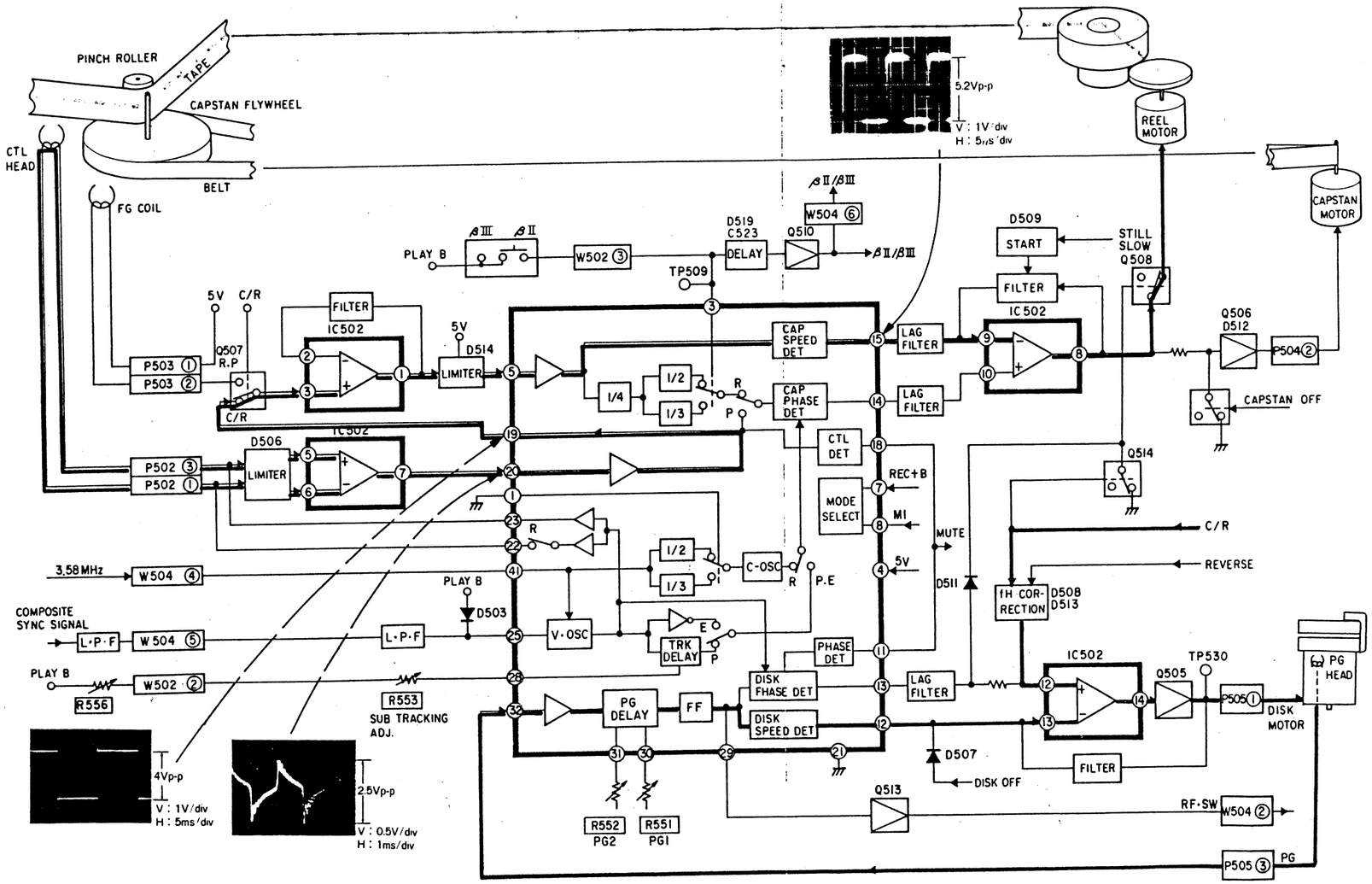
(Record mode)



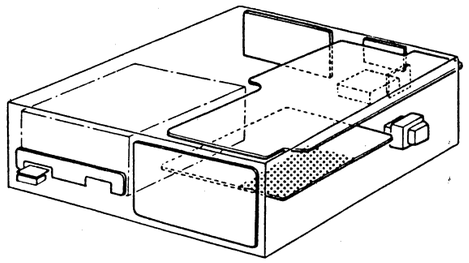
(Play mode)

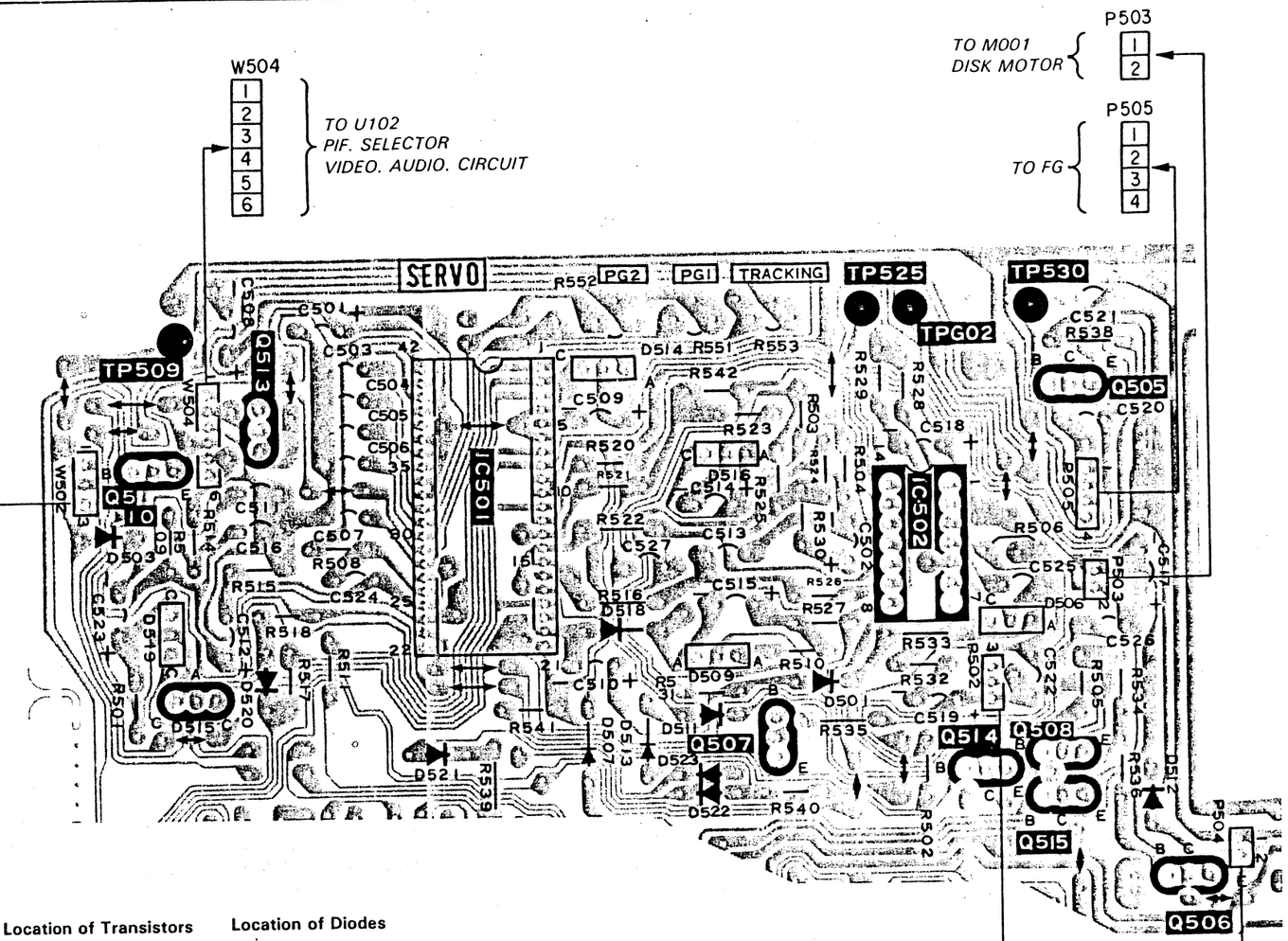

PINCH ROLLER
TAPE
CAPSTAN FLYWHEEL
CTL HEAD
FG COIL
BELT
11Vp-p
V : 2V/div
H : 1ms/div
PLAY B
βIII βII
W502 ③
TP509
D519
C523
DELAY
Q510
βII/βIII
W504 ⑥
D509
START
STILL SLOW
Q508
FILTER
IC502
5V C/R
P503 ①
P503 ②
Q507
R.P
C/R
5V
D514
LIMITER
1/4
1/2
1/3
R
P
CAP SPEED DET
CAP PHASE DET
LAG FILTER
CTL DET
REC+B
MODE SELECT
MI
MUTE
5V
D511
C/R
REVERSE
1H COR-RECTION
D508
D513
Q514
Q506
D512
P504 ②
CAPSTAN OFF
CAPSTAN MOTOR
REEL MOTOR
4Vp-p
V : 1V/div
H : 5ms/div
5.2Vp-p
V : 1V/div
H : 5μs/div
0.5Vp-p
V : 0.2V/div
H : 10ms/div
P502 ③
P502 ①
D506
LIMITER
3.58MHz
W504 ④
COMPOSITE SYNC SIGNAL
L·P·F
W504 ⑤
PLAY B
W502 ②
R556
R553
SUB TRACKING ADJ.
D503
V·OSC
C-OSC
E
TRK DELAY
P
PG DELAY
FF
R552
PG2
R551
PG1
PHASE DET
DISK FHASE DET
DISK SPEED DET
IC502
Q505
TP530
P505 ①
DISK MOTOR
PG HEAD
D507
DISK OFF
FILTER
Q513
RF·SW
W504 ②
P505 ③
PG
1.2p-p
V : 0.5V/div
H : 0.1μs/div
1.5Vp-p
V : 0.5/div
H : 10ms/div
3.4Vp-p
V : 1V/div
H : 5ms/div
3.7Vp-p
V : 1V/div
H : 2ms/div
5Vp-p
V : 1V/div
H : 10ms/div
5Vp-p
V : 1V/div
H : 5μs/div

(Cue/Review)


PINCH ROLLER
TAPE
CAPSTAN FLYWHEEL
CTL HEAD
BELT
FG COIL
5.2Vp-p
V : 1V/div
H : 5ms/div
REEL MOTOR
CAPSTAN MOTOR
βII/βIII
W504 ⑥
D519
C523
DELAY
Q510
PLAY B
βIII
βII
W502 ③
TP509
D509
START
FILTER
STILL SLOW
Q508
IC502
5V
C/R
P503 ①
P503 ②
Q507
R.P
FILTER
IC502
5V
D514
LIMITER
CAP SPEED DET
LAG FILTER
Q506
D512
P504 ②
CAPSTAN OFF
1/4
1/2
1/3
R
P
CAP PHASE DET
LAG FILTER
D506
P502 ③
P502 ①
LIMITER
IC502
CTL DET
Q514
REC+B
MODE SELECT
MI
MUTE
C/R
REVERSE
3.58MHz
W504 ④
PLAY B
D503
C-OSC
P.E
5V
D511
fH COR-RECTION
D508
D513
COMPOSITE SYNC SIGNAL
L·P·F
W504 ⑤
L·P·F
V·OSC
TRK DELAY
E
P
PHASE DET
IC502
TP530
Q505
PG HEAD
PLAY B
W502 ②
R556
R553
SUB TRACKING ADJ.
PG DELAY
FF
DISK FHASE DET
DISK SPEED DET
LAG FILTER
P505 ①
DISK MOTOR
D507
DISK OFF
FILTER
Q513
RF·SW
W504 ②
R552
PG2
R551
PG1
P505 ③
PG
4Vp-p
V : 1V/div
H : 5ms/div
2.5Vp-p
V : 0.5V/div
H : 1ms/div

20. Servo PC Board





Upper line : REC values without ( ) for both ßII/ßIII

Lower line : PLAY (0.0V/0.0V)→(ßII/ßIII)

Voltage

Symbol No.	B	C	E
Q505	5.4	13.8	4.1
			4.1
Q506	(6.6/4.8)	13.8	(6.0/4.1)
	(6.8/4.9)	13.4	(6.8/4.3)
Q507			2.1
			0.3
Q508		5.3	6.5
	6.5	5.1	6.5
Q510	(0.9/4.9)	5.0	(0.2/4.2)
	(0.9/4.9)	5.0	(0.2/4.2)
Q513		2.5	5.0
		2.5	5.0
Q514		3.0	0
		6.5	0
Q515		5.1	0

Location of Transistors

Symbol No.	Location
Q505	C-9
Q506	F-9
Q507	E-7
Q508	E-9
Q510	C-4
Q513	C-5
Q514	E-8
Q515	E-9

Location of Adjusting VRs

Symbol No.	Location
R551	C-7
R552	C-7
R553	C-7

Location of Diodes

Symbol No.	Location
D501	D-8
D503	D-4
D506	D-9
D507	E-6
D508	E-7
D509	D-7
D511	E-7
D512	E-9
D513	E-7
D514	C-7
D515	E-4
D516	C-7
D518	D-7
D519	D-4
D520	D-5
D521	E-6
D522	E-7
D523	E-7

21. Servo Circuit

Capstan servo signal
Reel servo signal at Cue/Review
Disk servo signal
Record control signal
Playback control signal

U502

(REC) 1.2Vp-p V : 0.5V/div H : 0.1μs/div
(PLAY) 1.2p-p V : 0.5V/div H : 0.1μs/div
W504
TO U102 PIF SELECTOR, VIDEO, AUDIO CIRCUITS
GRN CTL
GRY SW PULSE
WHT/GRY 3.58MHz
BLU VSYNC
WHT βII/βIII
(REC) 1.5Vp-p V : 0.5V/div H : 5ms/div
3.7Vp-p V : 1V/div H : 2ms/div
5Vp-p V : 1V/div H : 10ms/div
W502
TO UX02 TIMER, SELECTOR, COUNTER CIRCUITS
TRACKING 1
TRACKING 2
βII/βIII
(TO R556 TRACKING VR βII/βIII SWITCH)
(PLAY) 3.4Vp-p V : 1V/div H : 5ms/div
(REC) Reference Signal 1Vp-p V : 0.5V/div H : 5ms/div
(REC) 2.1Vp-p V : 0.5V/div H : 10ms/div

TO U502 LOGIC CIRCUIT
REW, PLAY, FF PLAY(M2), PLAY+B, βII/βIII, PLAY+B, M1, SERVO LOCK, SLOW+STILL, CAPSTAN OFF (SLOW PULSE), DRUM OFF +5V, SERVO REC +B, REVERSE, REEL ERROR +12V

1.2Vp-p V : 0.5V/div H : 1ms/div
5Vp-p V : 1V/div H : 5μs/div
5.2Vp-p V : 1V/div H : 5μs/div

IC 501 TD6314P-01 SERVO
Q513 RN2203 BUFFER
Q510 2SC2458-Y BUFFER
Q514 RN1201 SWITCH
Q508 RN2202 SWITCH
Q515 RN1203 SWITCH
Q505 2SD549Y DRIVE
Q507 RN1204 SWITCH (CTL/FG SW)
IC502 TA75902P AMP
1/2, 1/3, 1/4, C-OSC, H OSC, V-OSC, PG DALAY, FLIP FLOP, TRACKING DELAY, SUB TRACKING, MODE SELECT, PHASE DET, DISK SPEEDDET, DISK PHASE DET, CAP PHASE DET, CAP SPEED DET, CTL DET, REC, PB, PG2, PG1, GND
DISK, FG, CAP, CTL

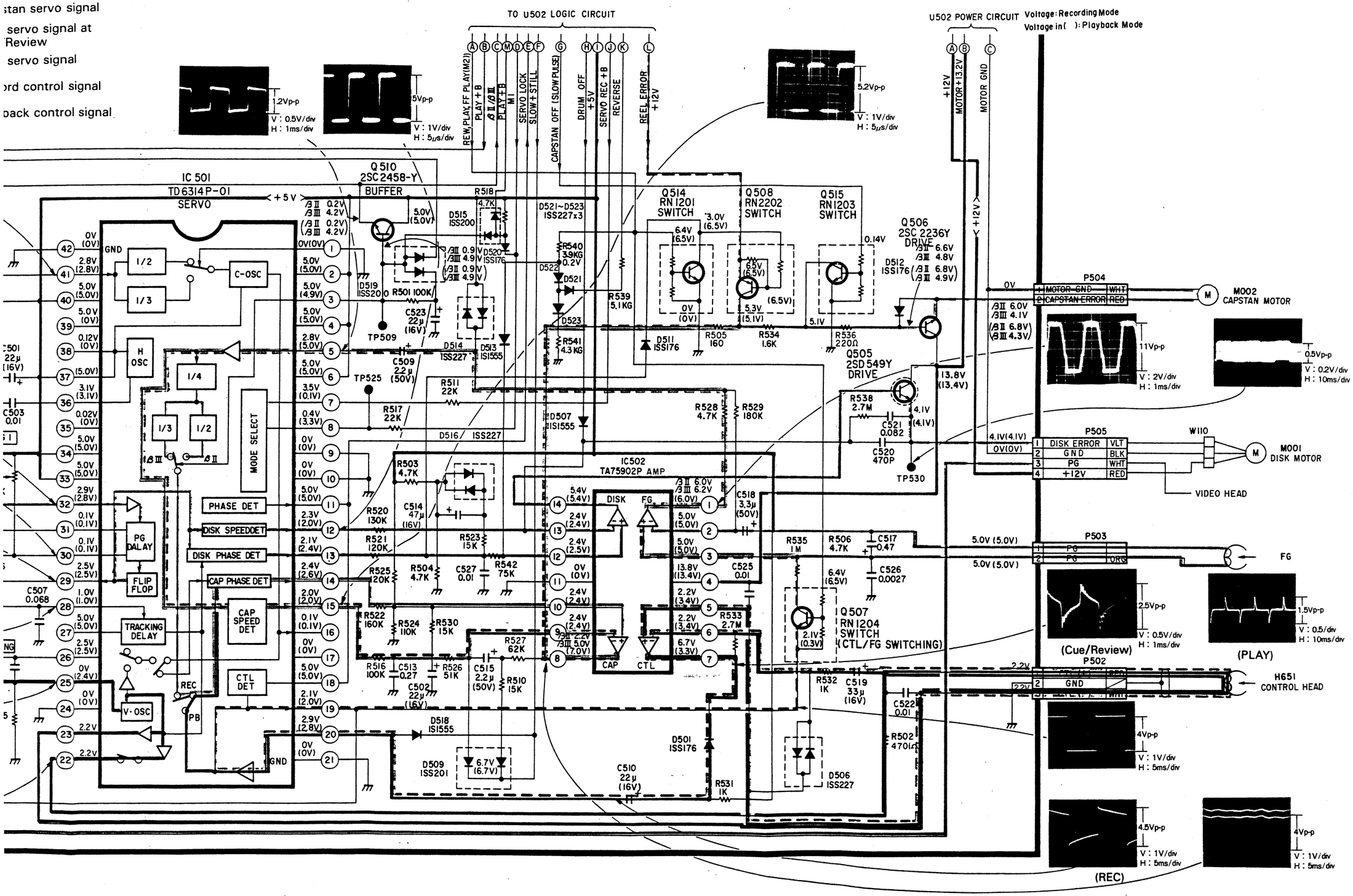
stan servo signal

servo signal at Review

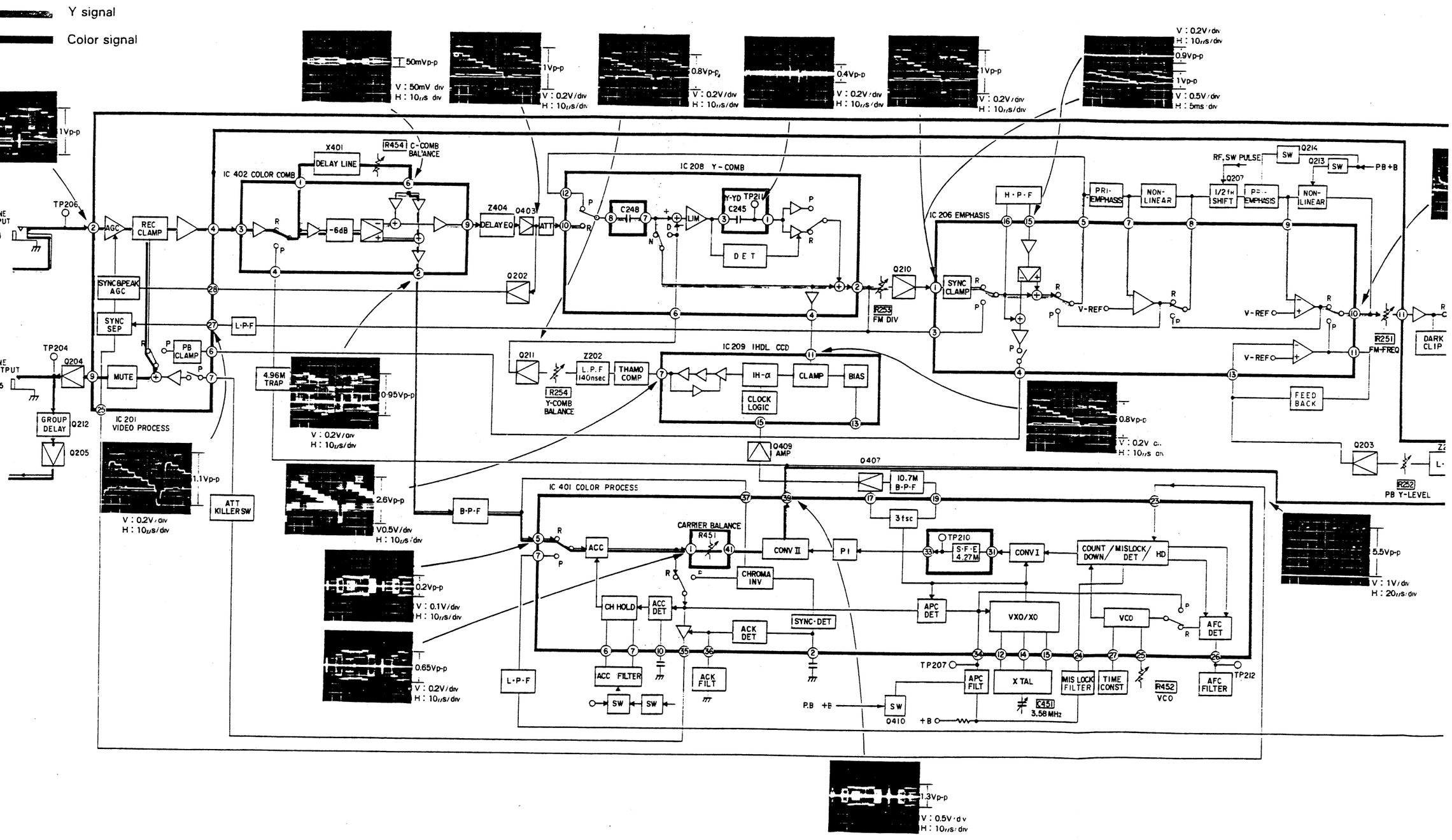
servo signal

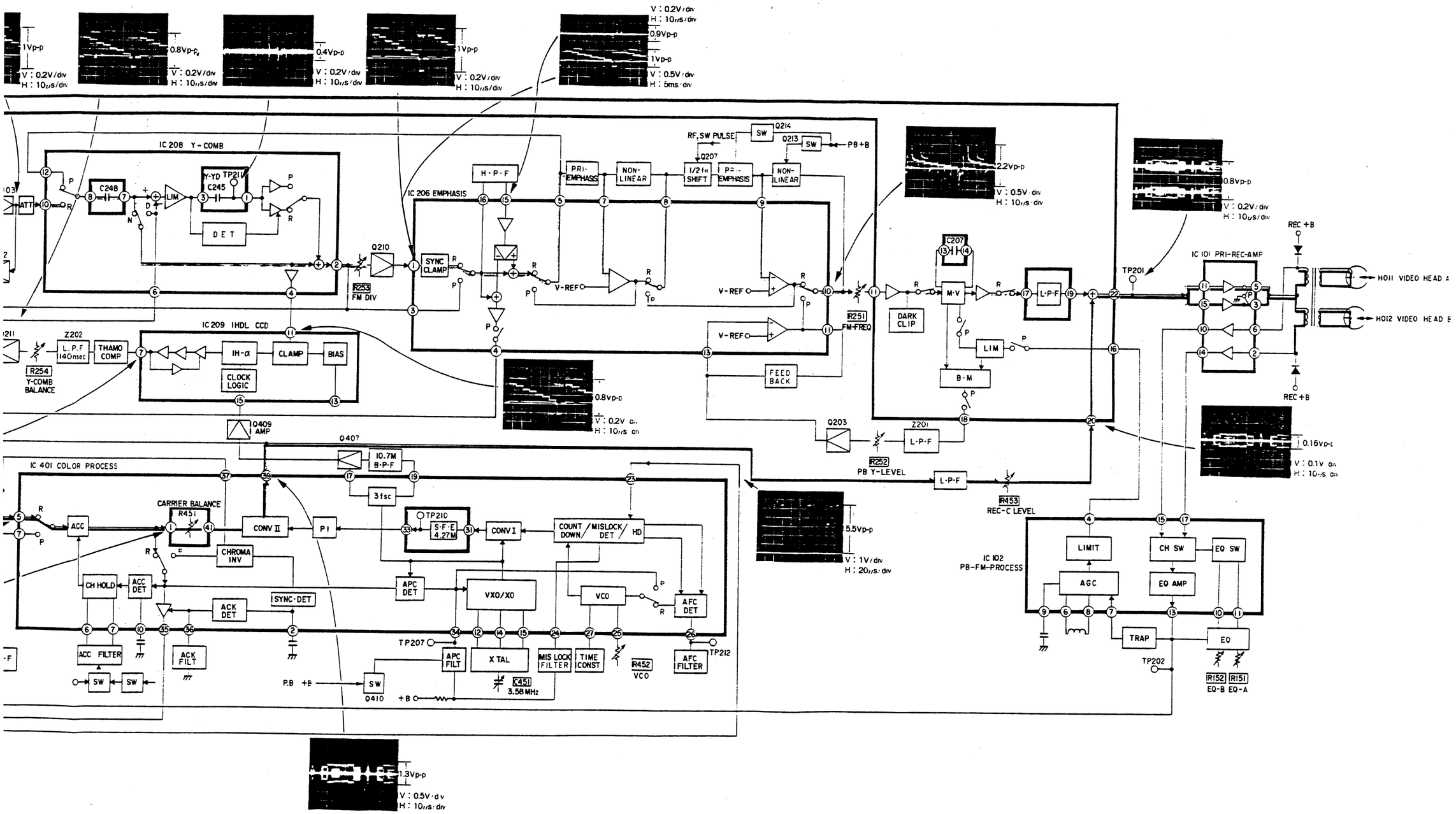
ord control signal

back control signal



22. Video Block Diagram (Rec Mode)

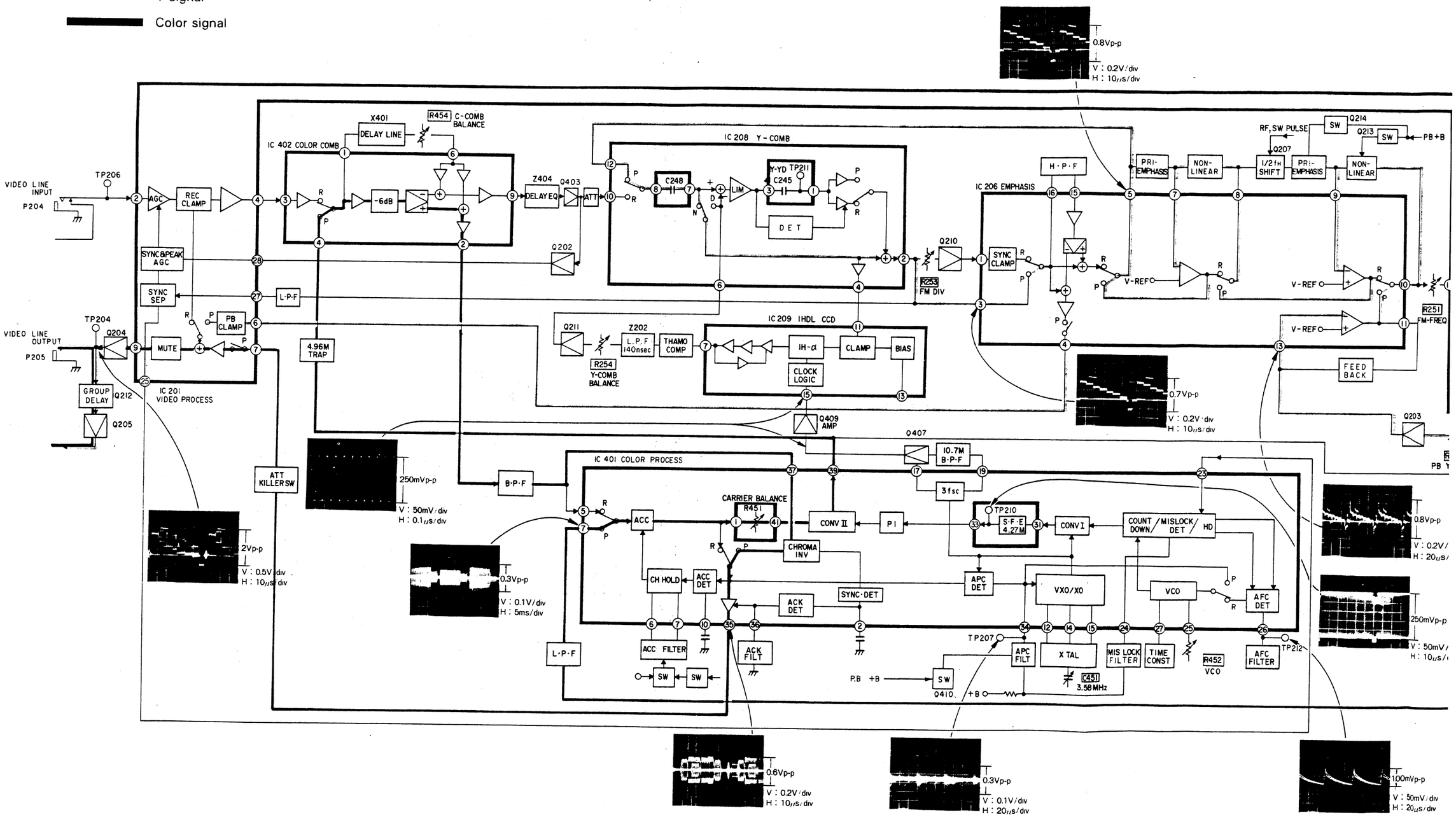


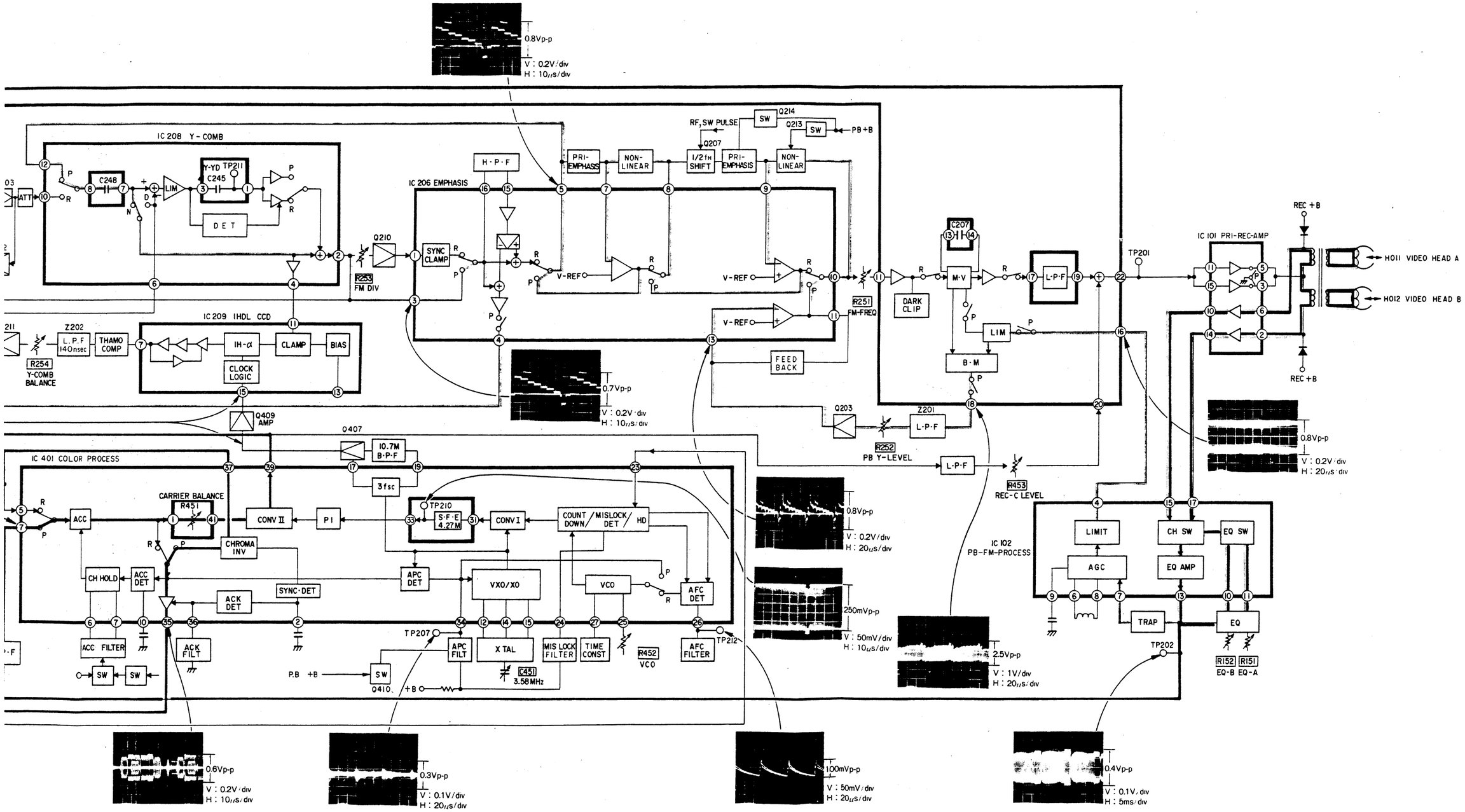

1Vp-p
V : 0.2V/div
H : 10㎲/div
0.8Vp-p
0.4Vp-p
1Vp-p
V : 0.2V/div
H : 10㎲/div
V : 0.2V/div
H : 10㎲/div
0.9Vp-p
1Vp-p
V : 0.5V/div
H : 5ms/div
IC 208 Y-COMB
IC 206 EMPHASIS
IC 209 IHDL CCD
IC 401 COLOR PROCESS
IC 101 PRI-REC-AMP
IC 102 PB-FM-PROCESS
ATT
C248
C245
LIM
DET
H-P-F
PRE-EMPHASIS
NON-LINEAR
1/2fH SHIFT
RF, SW PULSE
Q207
Q214
Q213
SW
PB+B
Q210
SYNC CLAMP
V-REF
R253
FM DIV
R251
FM-FREQ
DARK CLIP
C207
M-V
L-P-F
TP201
REC+B
HOII VIDEO HEAD A
HOI2 VIDEO HEAD B
2.2Vp-p
V : 0.5V/div
H : 10㎲/div
0.8Vp-p
V : 0.2V/div
H : 10㎲/div
FEED BACK
B-M
LIM
Z202
L.P.F 140nsec
THAMO COMP
IH-α
CLAMP
BIAS
CLOCK LOGIC
R254
Y-COMB BALANCE
Q409 AMP
0.8Vp-p
V : 0.2V/div
H : 10㎲/div
Q203
Z201
L-P-F
R252
PB Y-LEVEL
L-P-F
R453
REC-C LEVEL
0.16Vp-p
V : 0.1V/div
H : 10㎲/div
0407
10.7M B-P-F
3fsc
TP210
S-F-E 4.27M
CONV II
PI
CONV I
COUNT DOWN / MISLOCK DET / HD
CARRIER BALANCE
R451
ACC
CHROMA INV
CH HOLD
ACC DET
ACK DET
SYNC-DET
APC DET
VXO/XO
VCO
AFC DET
ACC FILTER
ACK FILT
APC FILT
X TAL
C451
3.58MHz
MIS LOCK FILTER
TIME CONST
R452
VCO
AFC FILTER
TP207
TP212
P.B +B
SW
0410
+B
5.5Vp-p
V : 1V/div
H : 20㎲/div
LIMIT
AGC
CH SW
EQ SW
EQ AMP
TRAP
EQ
TP202
IR152
EQ-B
IR151
EQ-A
1.3Vp-p
V : 0.5V/div
H : 10㎲/div

(Play Mode)

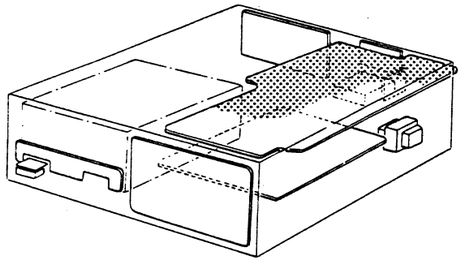
Y signal

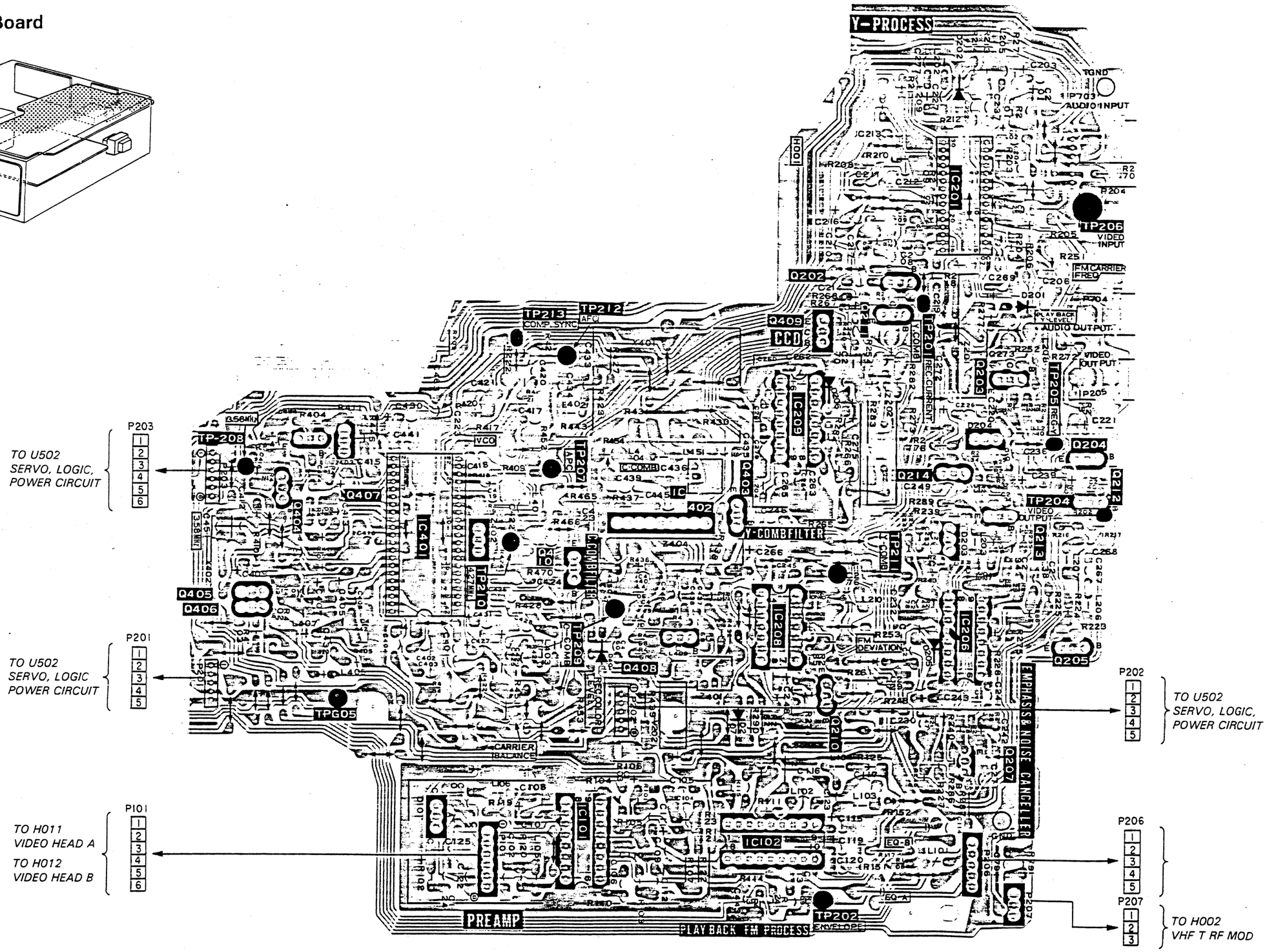
Color signal

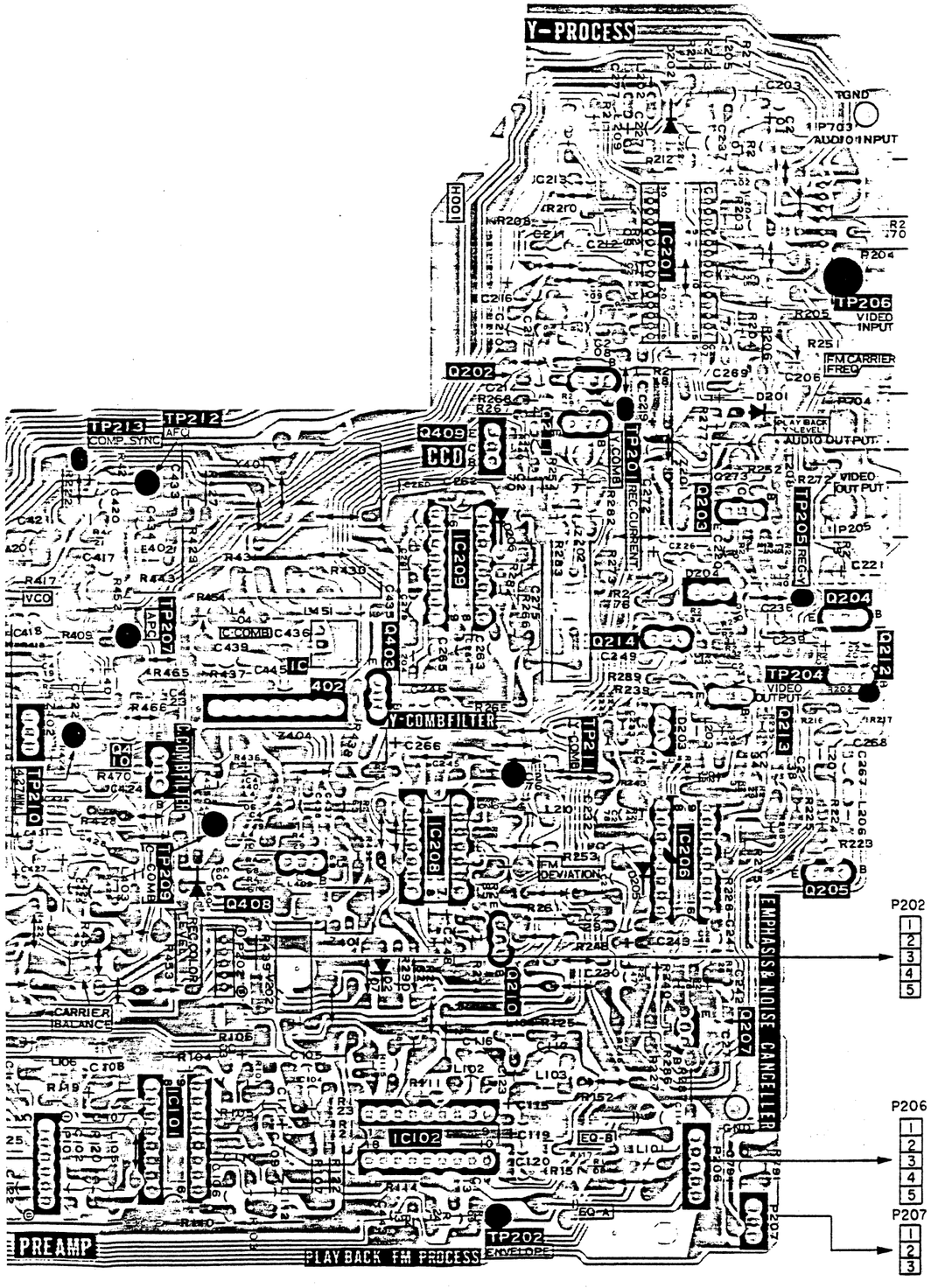



0.8Vp-p
V : 0.2V/div
H : 10μs/div
IC 208 Y-COMB
C248
Y-YD TP211
C245
LIM
DET
ATT
IC 206 EMPHASIS
H·P·F
PRI-EMPHASS
NON-LINEAR
RF, SW PULSE
Q207
1/2fH SHIFT
PRI-EMPHASIS
NON-LINEAR
SW
Q214
Q213
SW
PB+B
Q210
SYNC CLAMP
R253
FM DIV
V-REF
V-REF
V-REF
R251
FM-FREQ
FEED BACK
DARK CLIP
C207
M·V
L·P·F
LIM
B·M
TP201
IC 101 PRI-REC-AMP
REC +B
REC +B
H011 VIDEO HEAD A
H012 VIDEO HEAD B
IC 209 IHDL CCD
Z202
L.P.F 140nsec
THAMO COMP
IH-α
CLAMP
BIAS
CLOCK LOGIC
R254
Y-COMB BALANCE
Q409 AMP
0.7Vp-p
V : 0.2V/div
H : 10μs/div
Q203
Z201
L·P·F
R252
PB Y-LEVEL
L·P·F
R453
REC-C LEVEL
0.8Vp-p
V : 0.2V/div
H : 20μs/div
Q407
10.7M B·P·F
IC 401 COLOR PROCESS
3fsc
TP210
S·F·E 4.27M
CARRIER BALANCE
R451
ACC
CONV II
PI
CONV I
COUNT DOWN / MISLOCK DET / HD
CHROMA INV
CH HOLD
ACC DET
APC DET
VXO/XO
VCO
AFC DET
ACK DET
SYNC·DET
ACC FILTER
ACK FILT
TP207
APC FILT
X TAL
C451
3.58MHz
MIS LOCK FILTER
TIME CONST
R452
VCO
AFC FILTER
TP212
P.B +B
SW
Q410
+B
0.8Vp-p
V : 0.2V/div
H : 20μs/div
250mVp-p
V : 50mV/div
H : 10μs/div
2.5Vp-p
V : 1V/div
H : 20μs/div
IC 102
PB-FM-PROCESS
LIMIT
AGC
CH SW
EQ AMP
EQ SW
TRAP
EQ
TP202
R152
EQ-B
R151
EQ-A
0.8Vp-p
V : 0.2V/div
H : 20μs/div
0.6Vp-p
V : 0.2V/div
H : 10μs/div
0.3Vp-p
V : 0.1V/div
H : 20μs/div
100mVp-p
V : 50mV/div
H : 20μs/div
0.4Vp-p
V : 0.1V/div
H : 5ms/div

23. Video PC Board







Location of ICs

Symbol No.	Location
IC101	G-6
IC102	G-8
IC201	B-9
IC206	E-9
IC208	E-8
IC209	D-8
IC401	E-5
IC402	D-7

Location of Diodes

Symbol No.	Location
D101	G-5
D201	C-10
D202	A-9
D203	E-9
D204	D-9
D205	E-9
D206	C-8
D207	F-7
D401	E-6

Location of adjusting VRs

Symbol No.	Location
R151	G-9
R152	G-9
R251	B-10
R252	C-9
R253	E-8
R254	C-8
R451	F-6
R452	D-6
R453	F-6
R454	D-6

Voltage of transistors

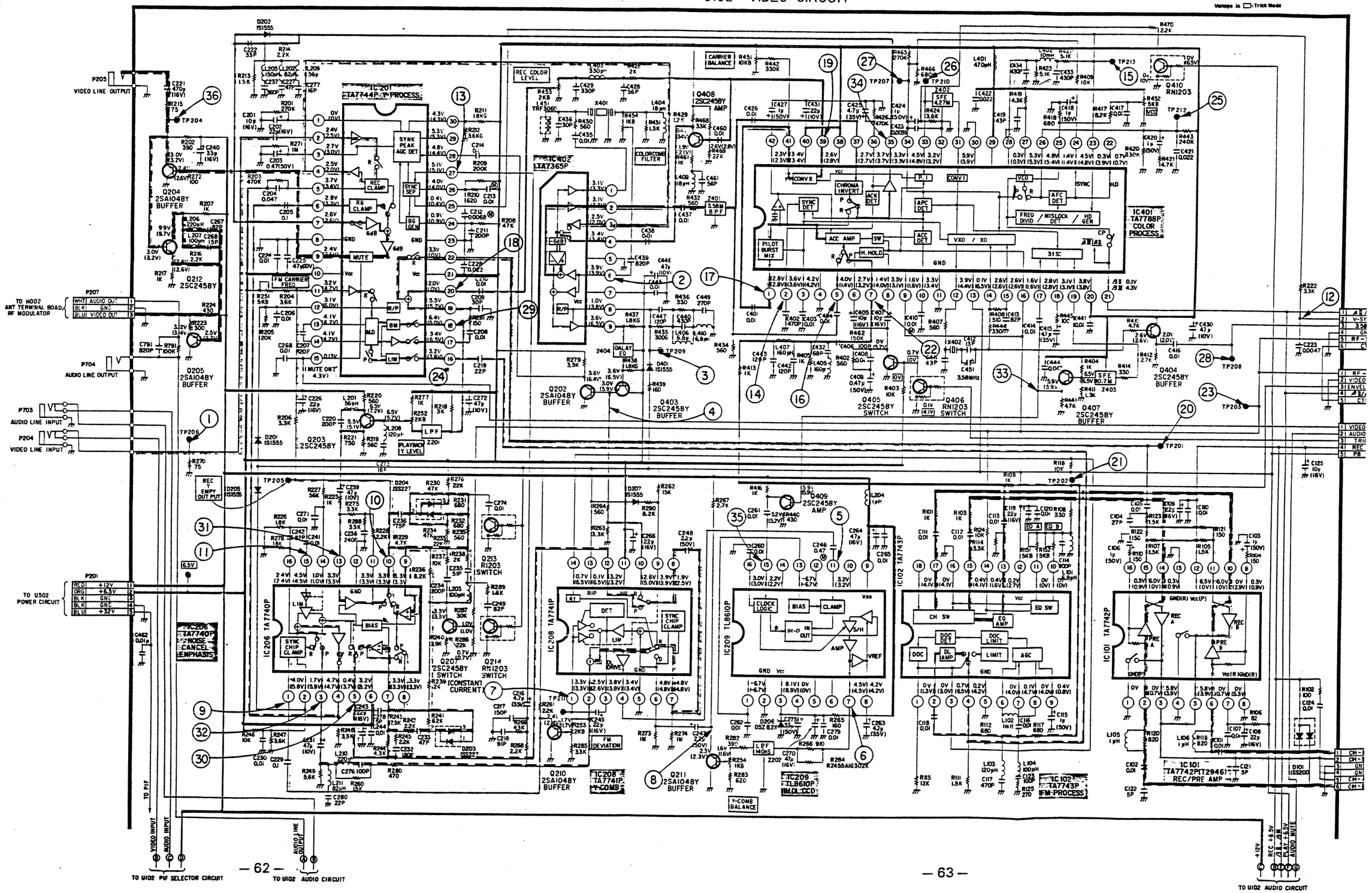
V : Rec mode
(V) : Play mode
V : Trig mode

	B	C	E	Location
Q202	3.0 (5.9)	— —	3.6 (6.4)	C-9
Q203	6.5 5.7	6.5 (7.2)	5.5 (5.1)	C-9
Q204	2.4 (2.6)	— —	3.0 (3.2)	D-10
Q205	2.5 (2.7)	— —	3.2 (3.4)	E-10
Q207	1.0 (1.0)	3.3 (3.3)	0.7 (0.7)	F-9
Q210	1.7 (1.7)	— —	2.4 (2.4)	F-8
Q211	1.6 (1.6)	— —	2.3 (2.3)	C-9
Q212	3.0 (3.2)	9.7	2.4 (2.6)	D-10
Q213	0.1 (6.5)	3.3 (3.3)	— —	D-9
Q214	0.1 (6.5)	3.3 (6.5)	— —	D-9
Q403	3.6 (6.5)	6.5 (6.5)	3.0 (5.9)	D-7
Q404	2.6 (2.6)	6.5 (6.5)	2.0 (2.0)	D-4
Q405	0.7 0	0 (5.7)	— 0	E-4
Q406		0.7 0	0.1 4.1	E-4
Q407	6.5 (6.5)	6.5 (6.5)	5.9 (5.9)	D-4
Q408	2.6 (2.8)	3.4 (3.4)	1.9 (2.1)	E-7
Q409	5.9 (5.9)	— —	5.2 (5.2)	C-8
Q410	0 (6.5)	— —	0 0	E-6

24. Video Circuit

Playback color signal ■■■■■■■ Playback Y signal
Record color signal ■ ■ ■ ■ ■ ■ ■ Record Y signal

U102 VIDEO CIRCUIT

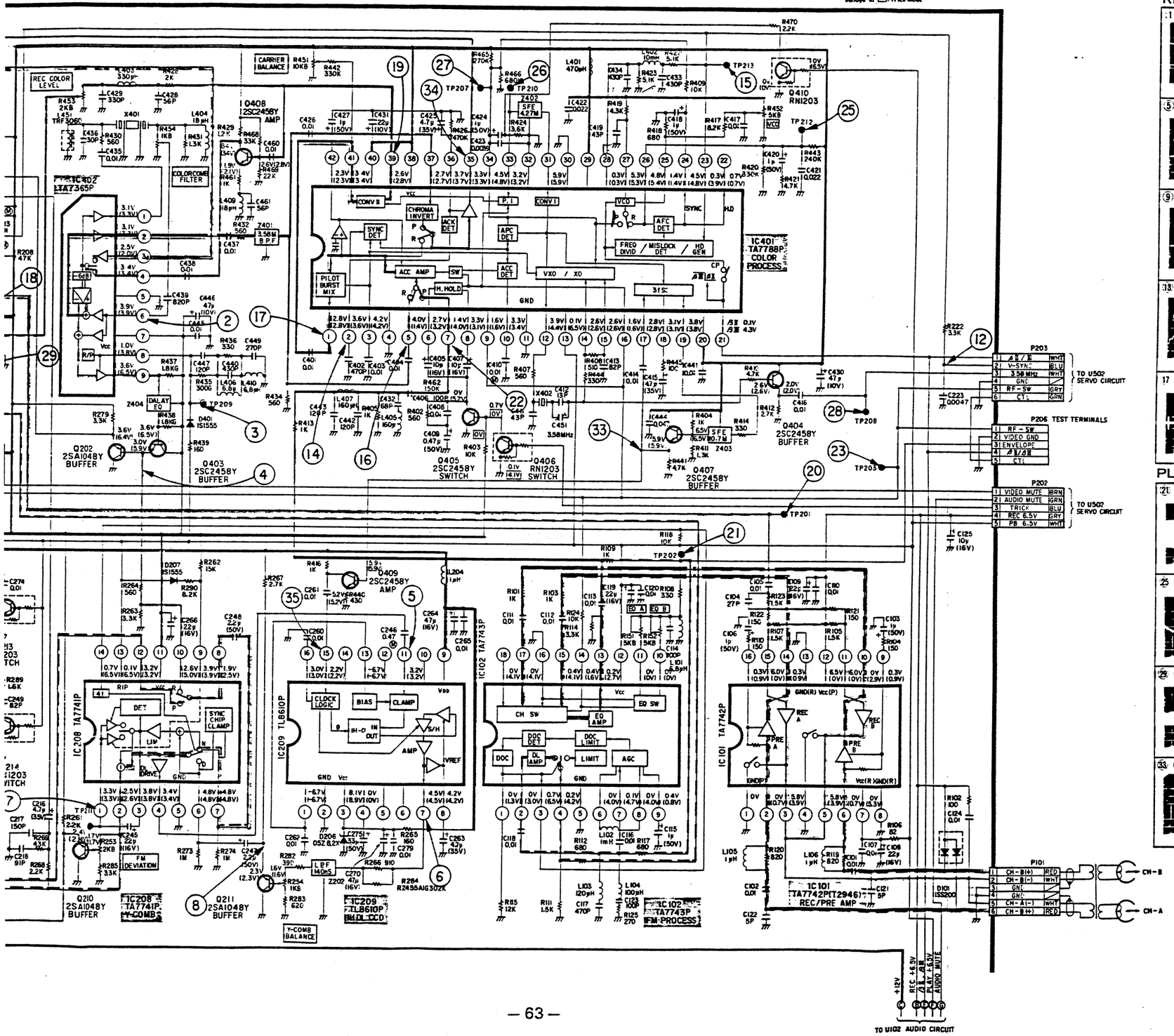


■■■ Playback Y signal

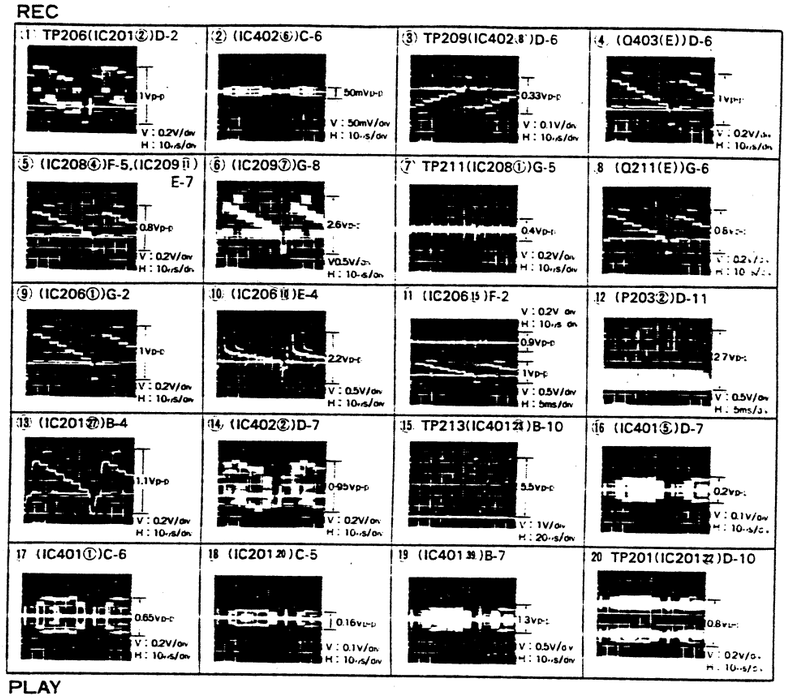
■■■ Record Y signal

U102 VIDEO CIRCUIT

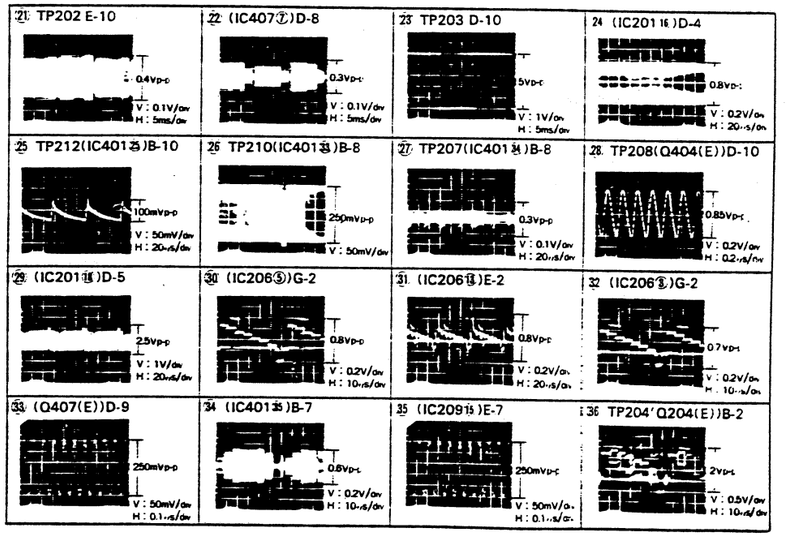
Voltage : Recording Mode
Voltage in ( ) : Playback Mode
Voltage in □ : Trick Mode



REC

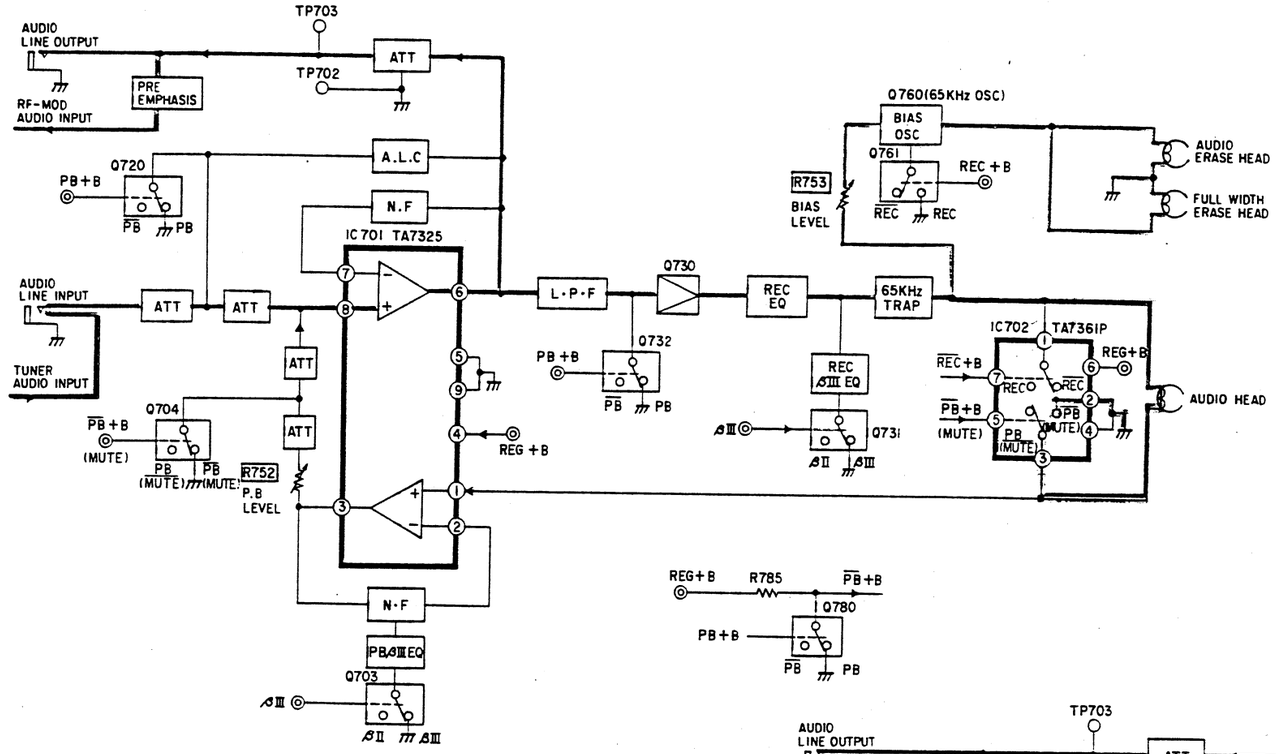


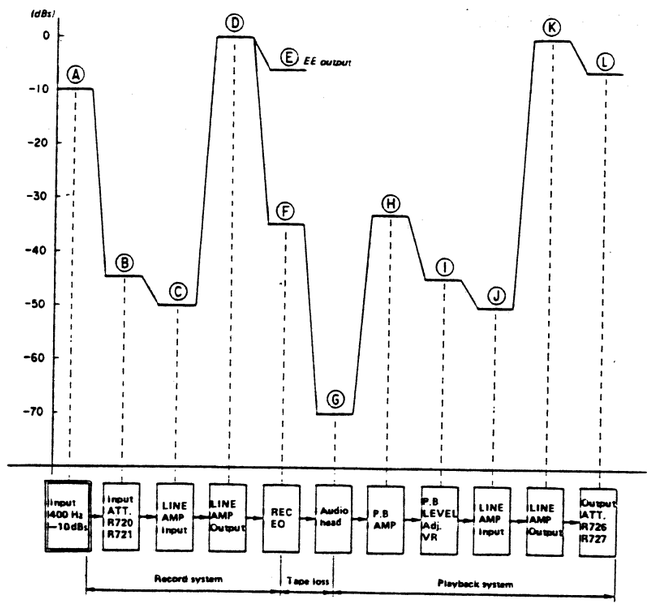
PLAY



25. Audio Block Diagram

(Record mode)

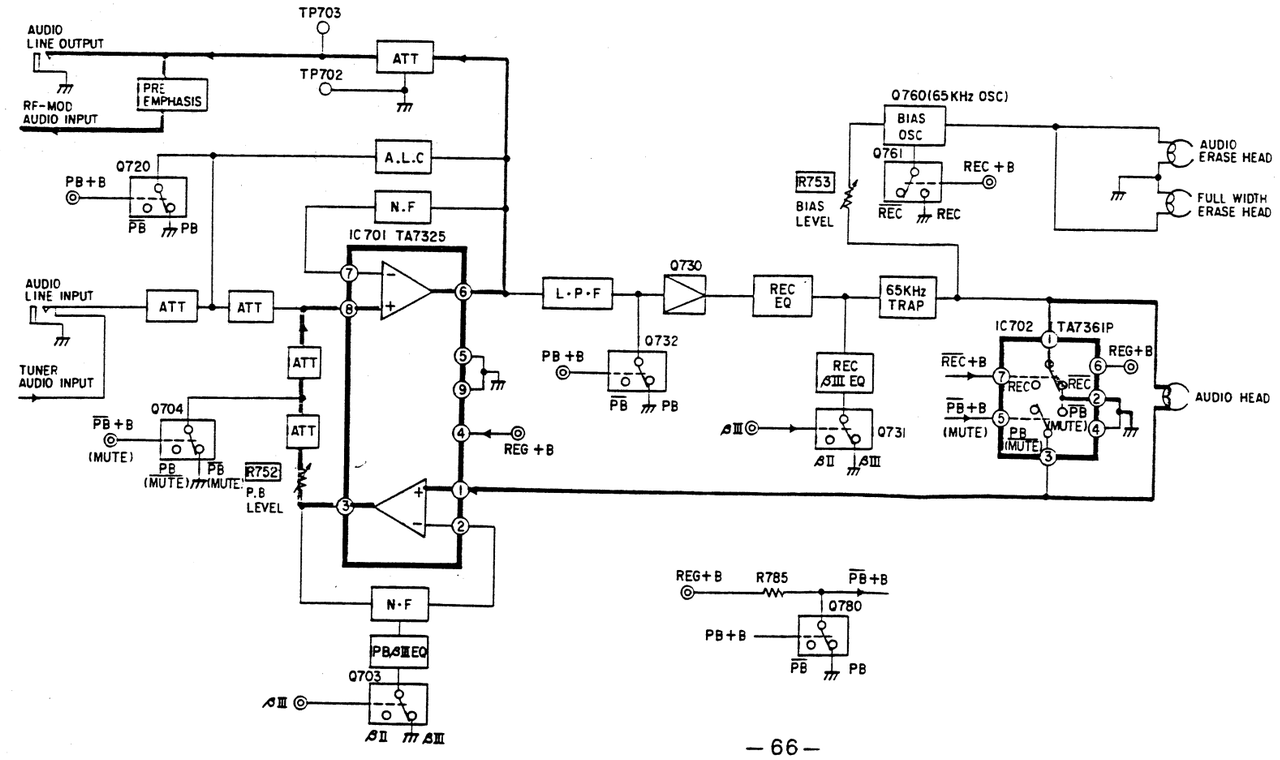


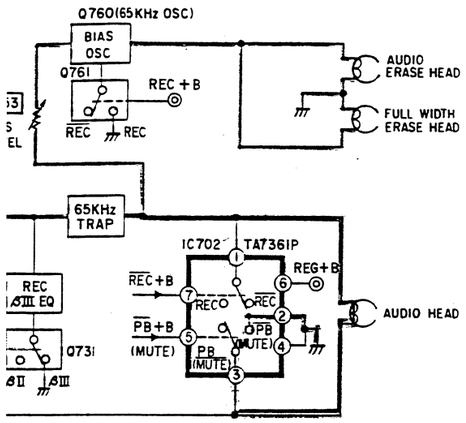


f = 400 Hz
0 dBs = 0.775V RMS

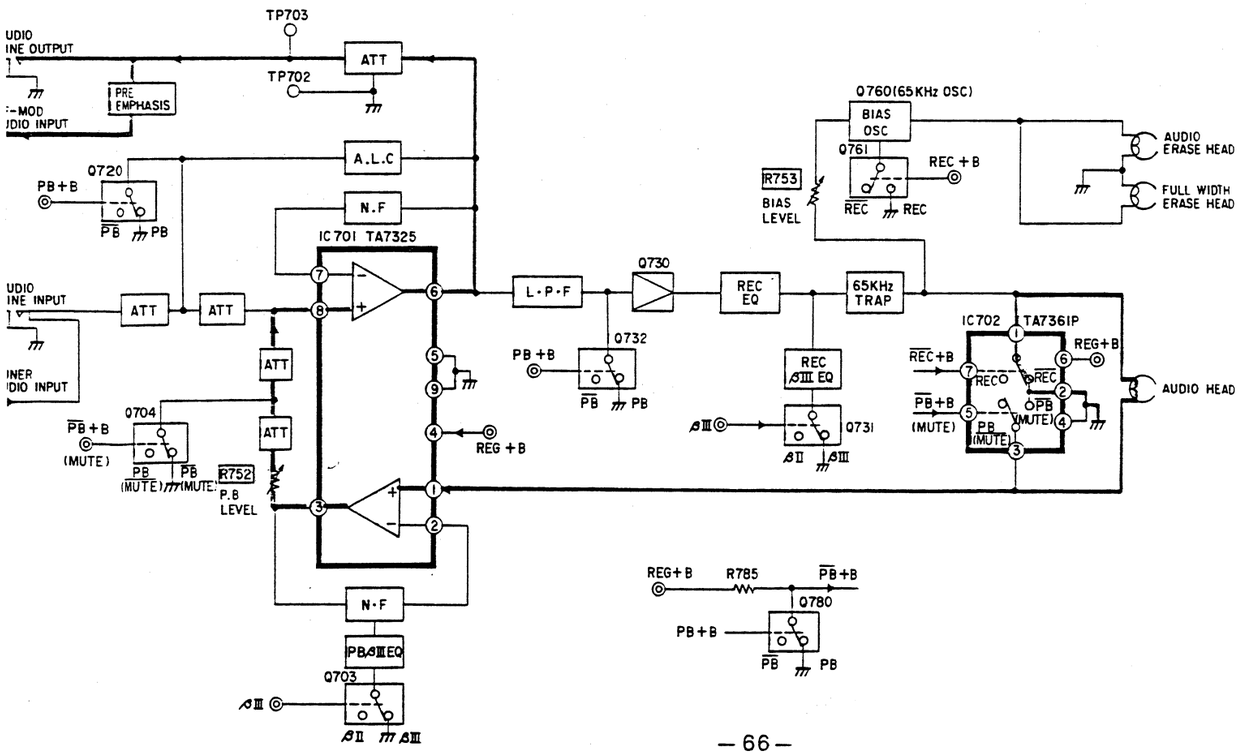
※ Ⓒ=Ⓙ
Ⓓ=Ⓚ
Ⓔ=Ⓛ

(Play mode)

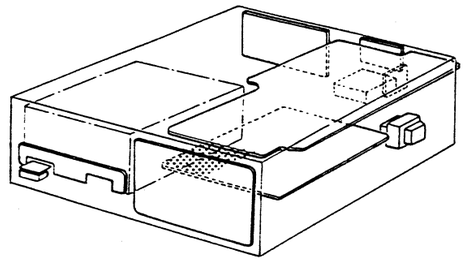




(Play mode)



26. Audio PC Board



Location of ICs

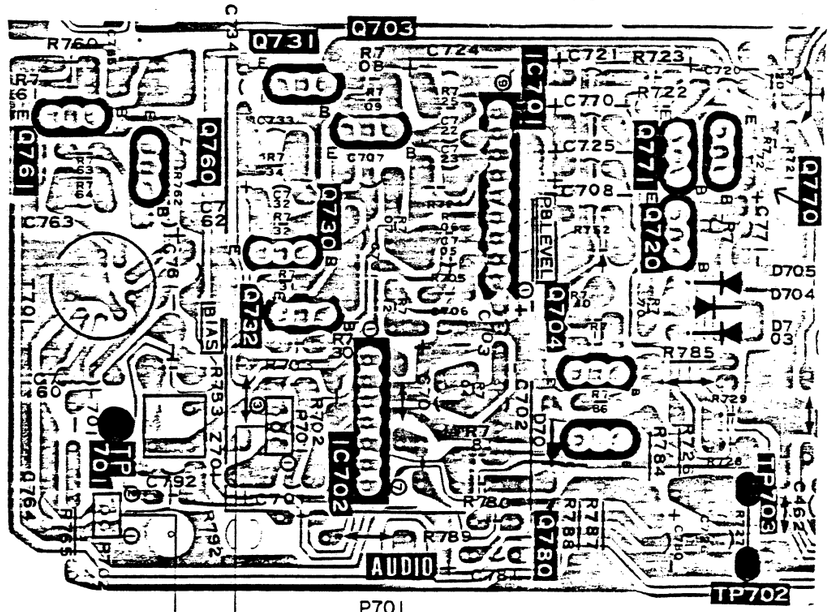
Symbol No.	Location
Q703	D-2
Q704	E-3
Q720	E-4
Q730	E-2
Q731	D-2
Q732	E-2
Q760	D-1
Q761	D-1
Q770	D-4
Q771	D-4
Q780	F-3

Location of Transistors

Symbol No.	Location
R752	E-3
R753	E-2

Location of Diodes

Symbol No.	Location
D701	F-3
D703	E-4
D704	E-4
D705	E-4



P701
3
2
1
TO H031
AUDIO HEAD

P702
2
1
TO H031
AUDIO ERASE HEAD

TO H032
FULL WIDTH ERASE HEAD

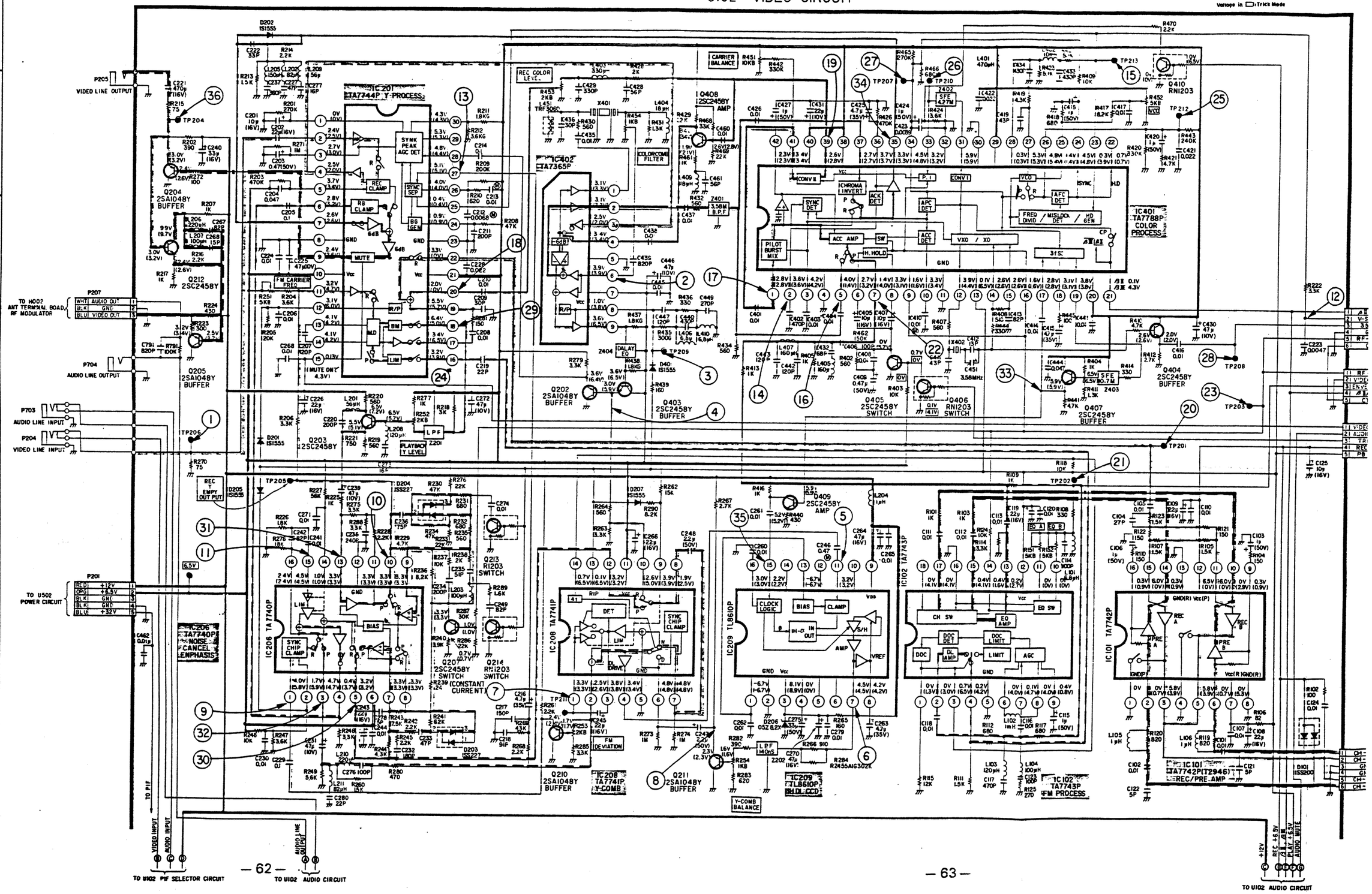
24. Video Circuit

Playback color signal ■■■■■■■ Playback Y signal

Record color signal ■ ■ ■ ■ ■ ■ ■ Record Y signal

U102 VIDEO CIRCUIT

Voltage : Recording Mode
Voltage in ( ): Playback Mode
Voltage in [ ]: Trick Mode

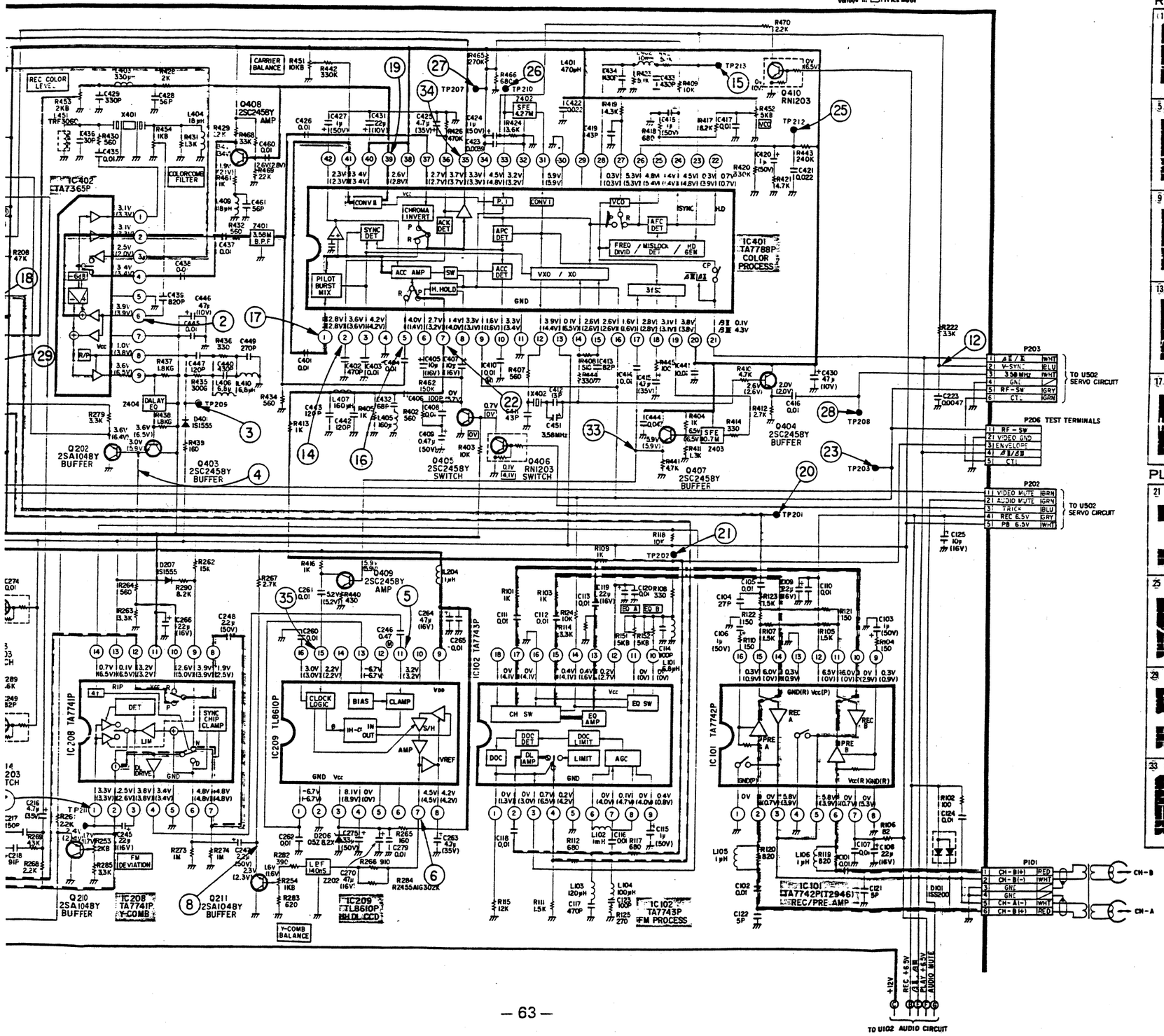


■■ Playback Y signal

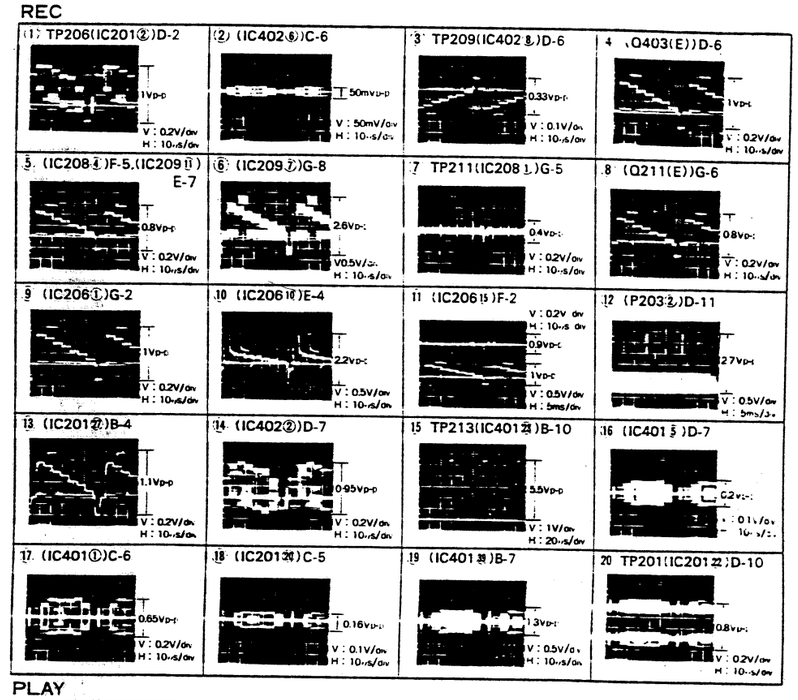
■■ Record Y signal

U102 VIDEO CIRCUIT

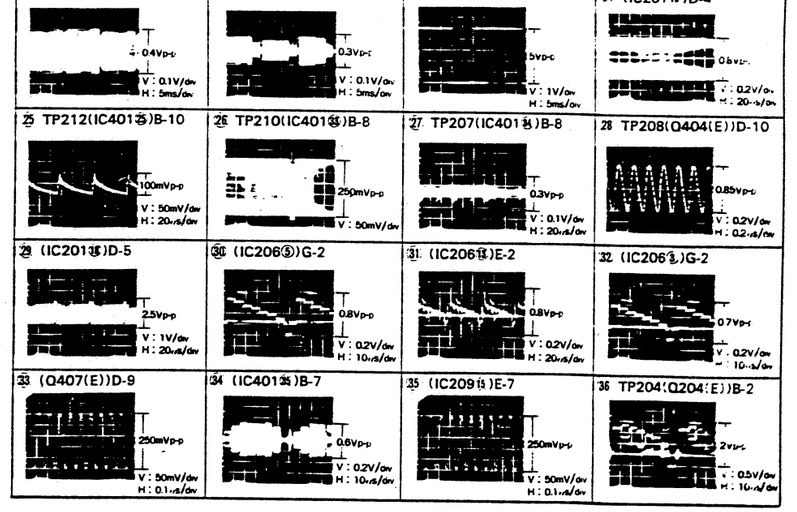
Voltage : Recording Mode
Voltage in ( ): Playback Mode
Voltage in □: Trick Mode



REC

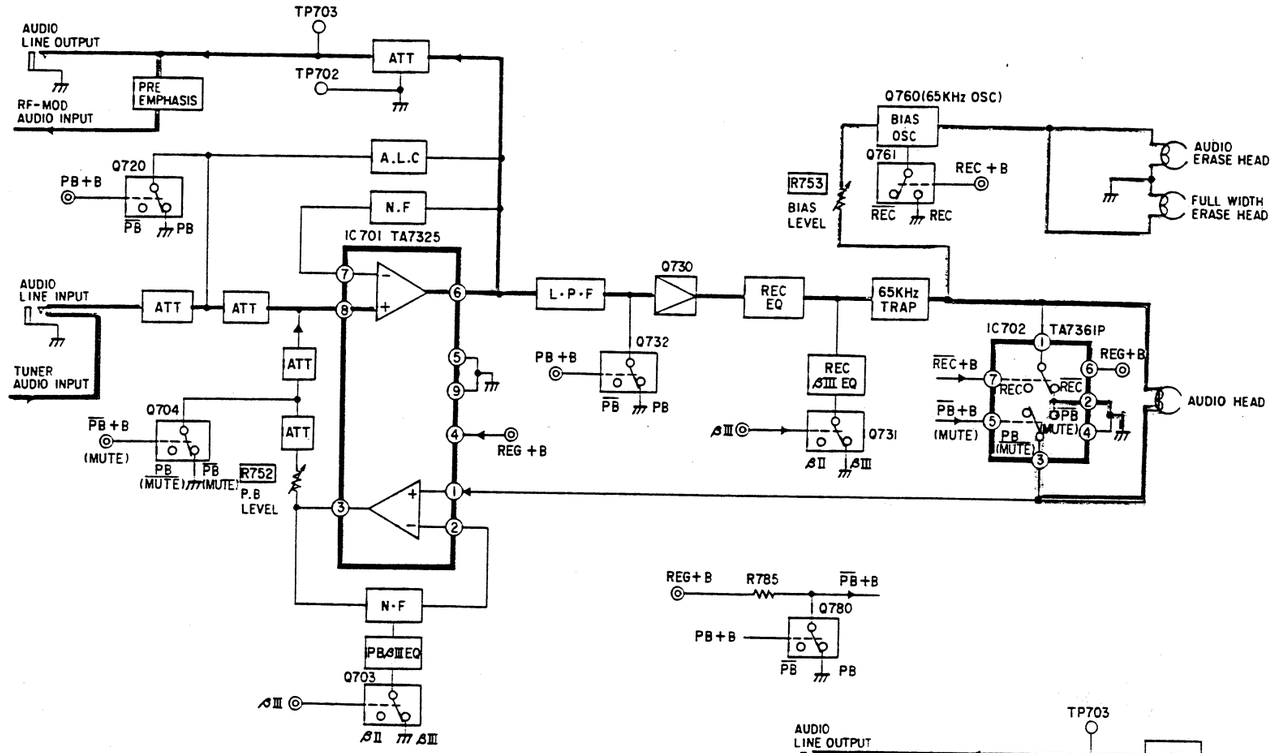


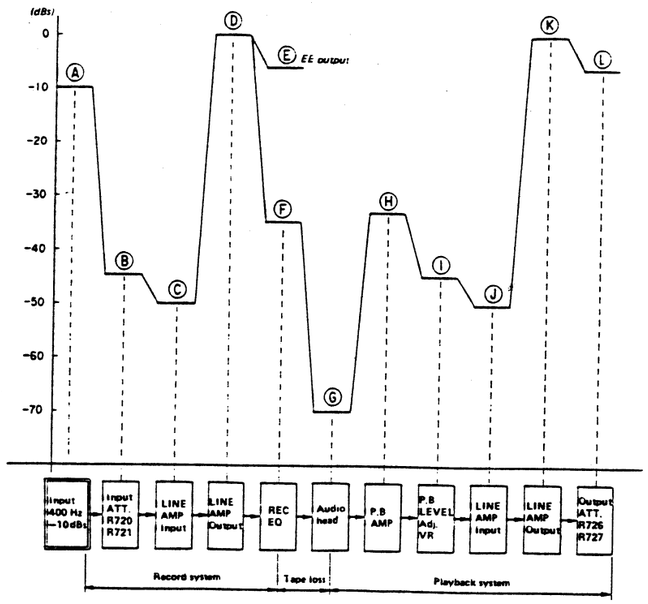
PLAY



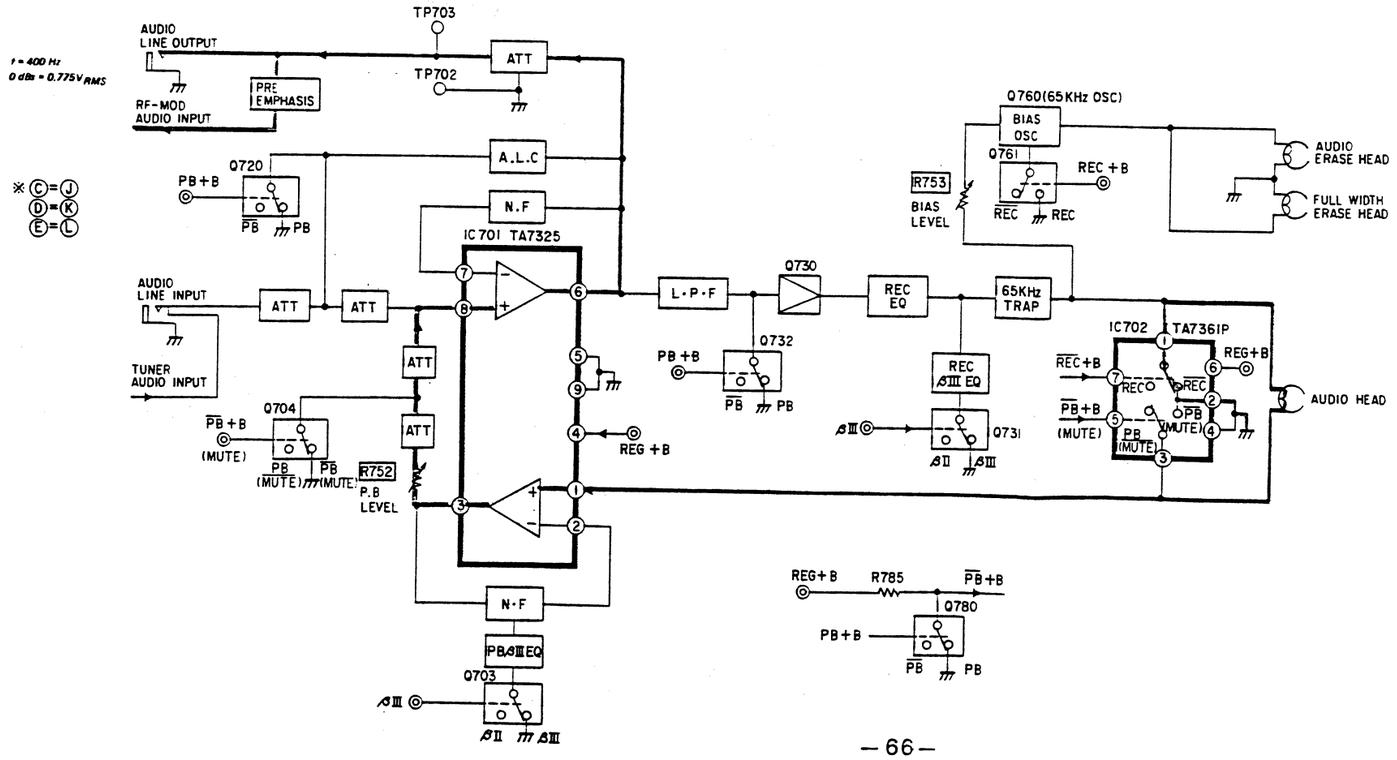
25. Audio Block Diagram

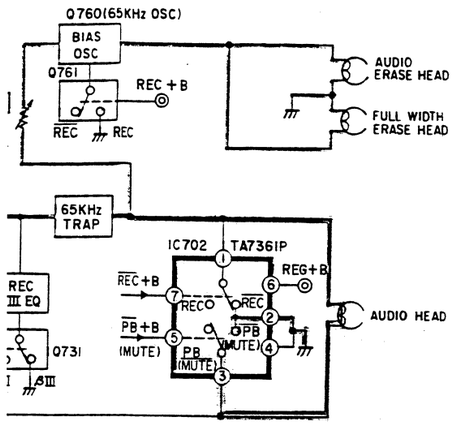
(Record mode)

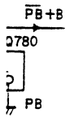




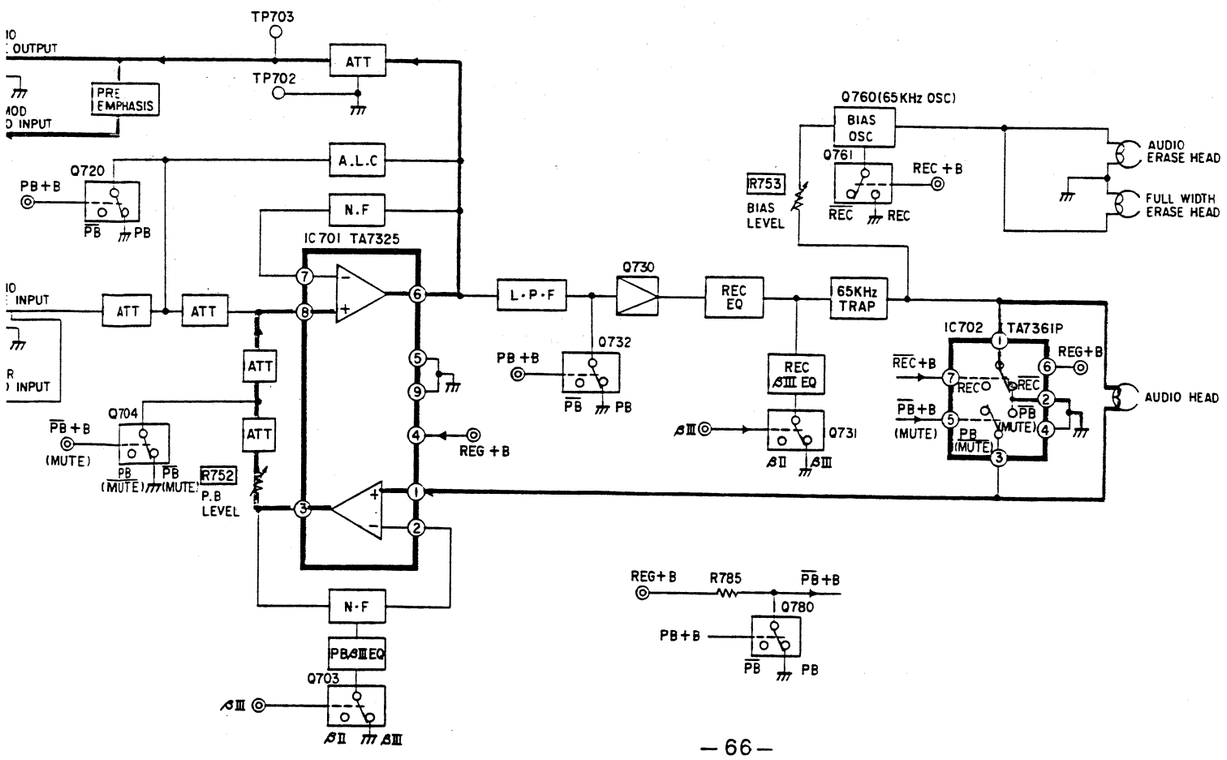
(Play mode)



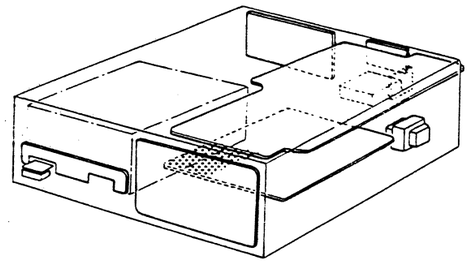




(Play mode)



26. Audio PC Board



Location of ICs

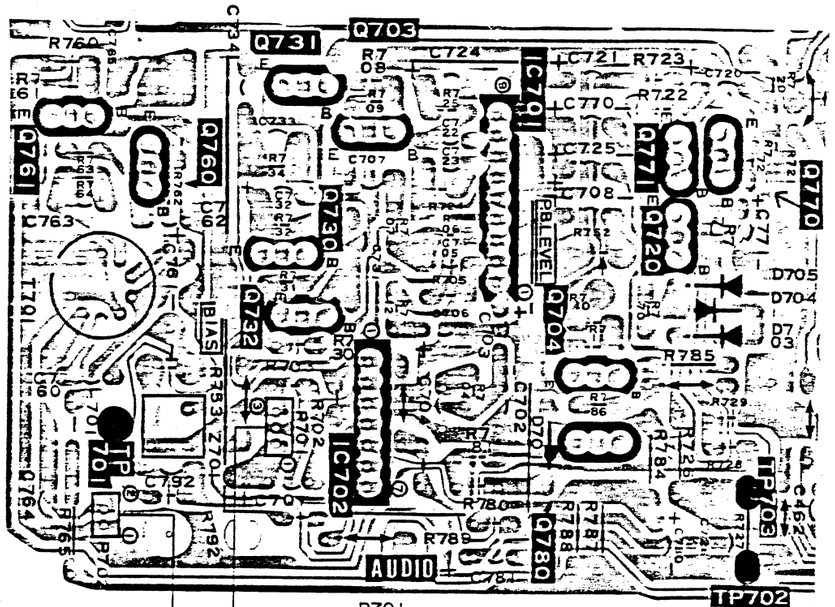
Symbol No.	Location
Q703	D-2
Q704	E-3
Q720	E-4
Q730	E-2
Q731	D-2
Q732	E-2
Q760	D-1
Q761	D-1
Q770	D-4
Q771	D-4
Q780	F-3

Location of Transistors

Symbol No.	Location
R752	E-3
R753	E-2

Location of Diodes

Symbol No.	Location
D701	F-3
D703	E-4
D704	E-4
D705	E-4



P701
3
2
1
TO H031
AUDIO HEAD

P702
2
1
TO H031
AUDIO ERASE HEAD

TO H032
FULL WIDTH ERASE HEAD

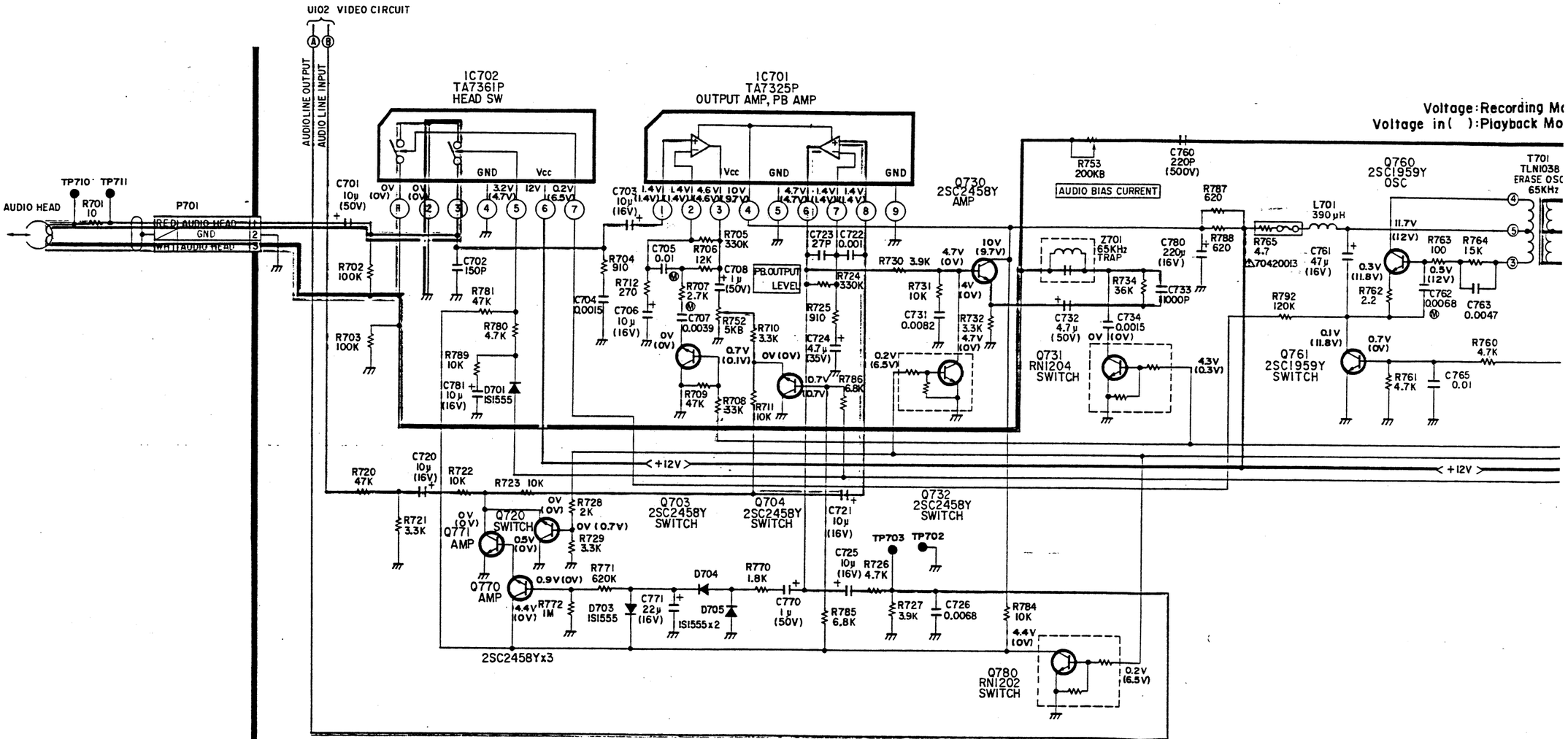
27. Audio Circuit

Audio playback signal

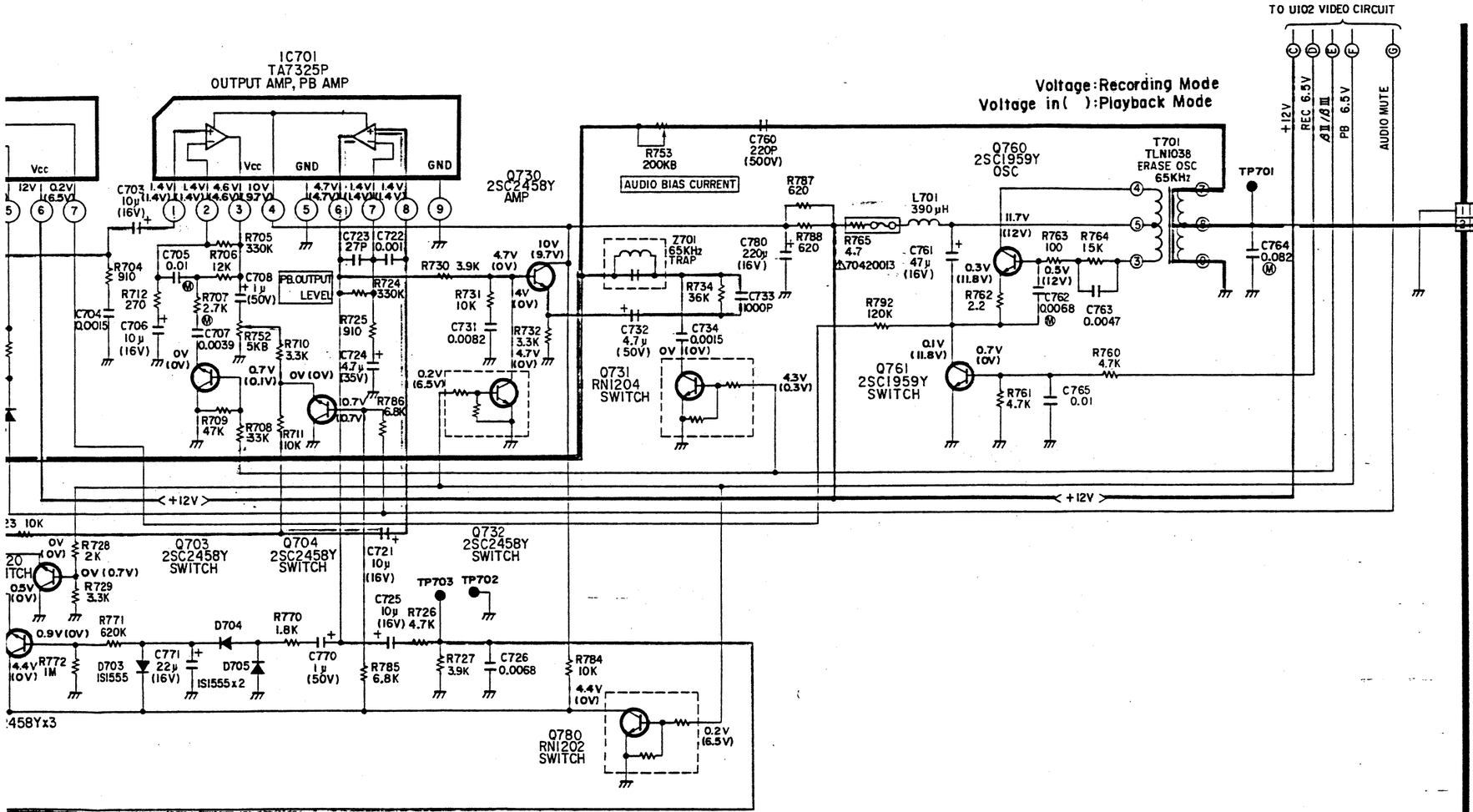
Audio record signal

Record bias and erase signals

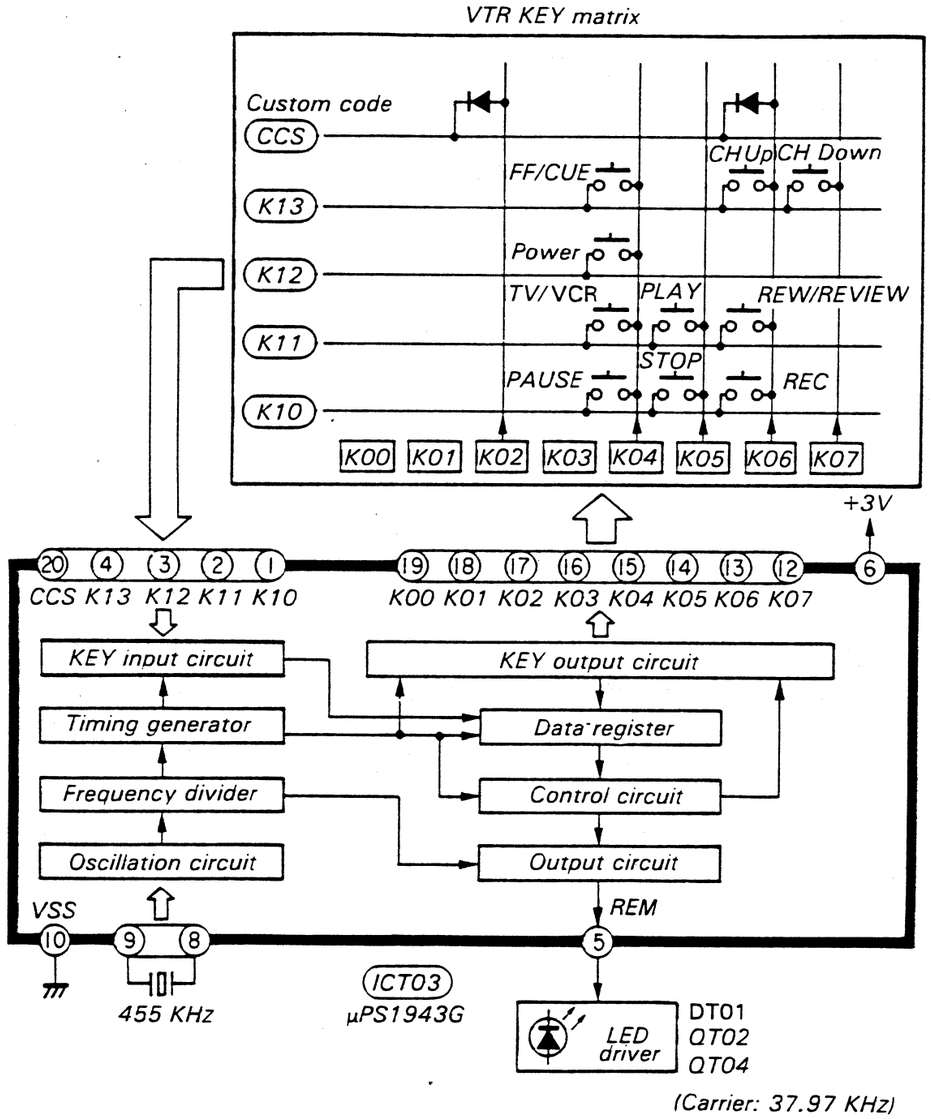
U102



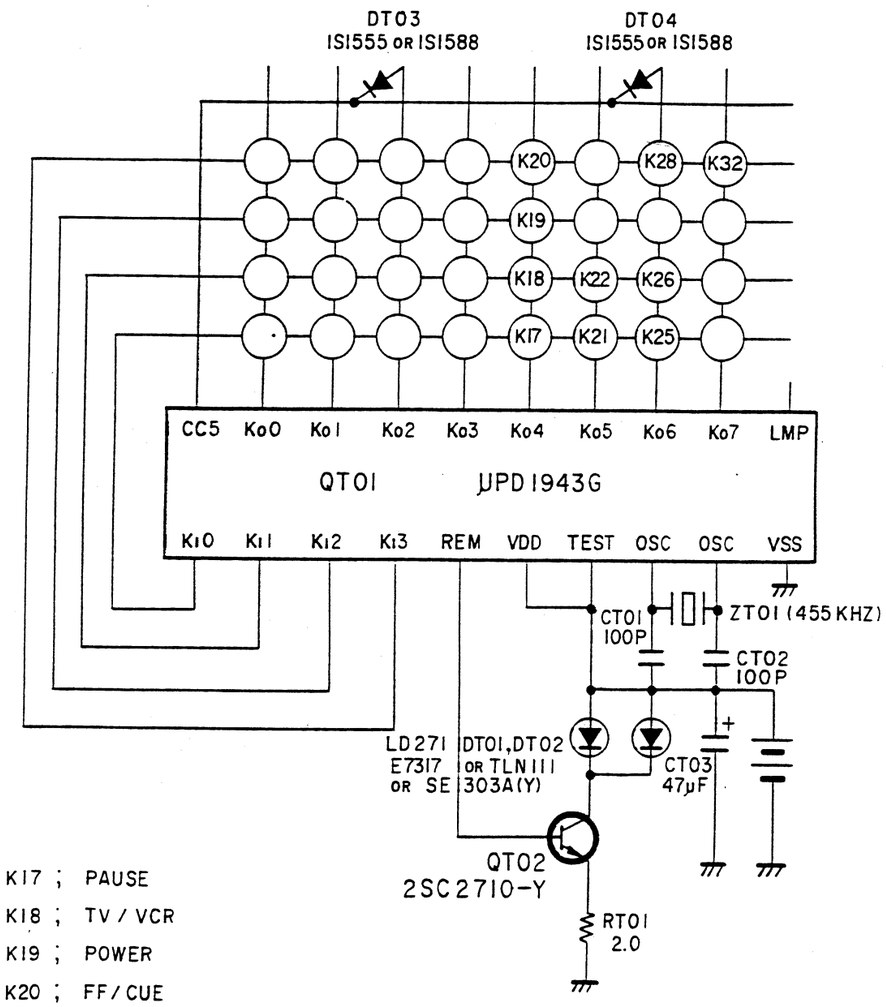
: signals


IC701
TA7325P
OUTPUT AMP, PB AMP
Vcc
GND
Voltage:Recording Mode
Voltage in( ):Playback Mode
TO UI02 VIDEO CIRCUIT
+12V
REC 6.5V
PB 6.5V
AUDIO MUTE
H031
AE HEAD
H032
FE HEAD
P702
GND
ERASE HEAD(H/T)
TP701
T701
TLN1038
ERASE OSC
65KHz
Q730
2SC2458Y
AMP
Q760
2SC1959Y
OSC
Q761
2SC1959Y
SWITCH
Q731
RN1204
SWITCH
Q703
2SC2458Y
SWITCH
Q704
2SC2458Y
SWITCH
Q732
2SC2458Y
SWITCH
Q780
RN1202
SWITCH
AUDIO BIAS CURRENT
PB.OUTPUT LEVEL
Z701
65KHz
TRAP
L701
390μH
TP703
TP702
D703
1S1555
D704
D705
1S1555x2
+12V
+12V

28. Remote Control Block Diagram

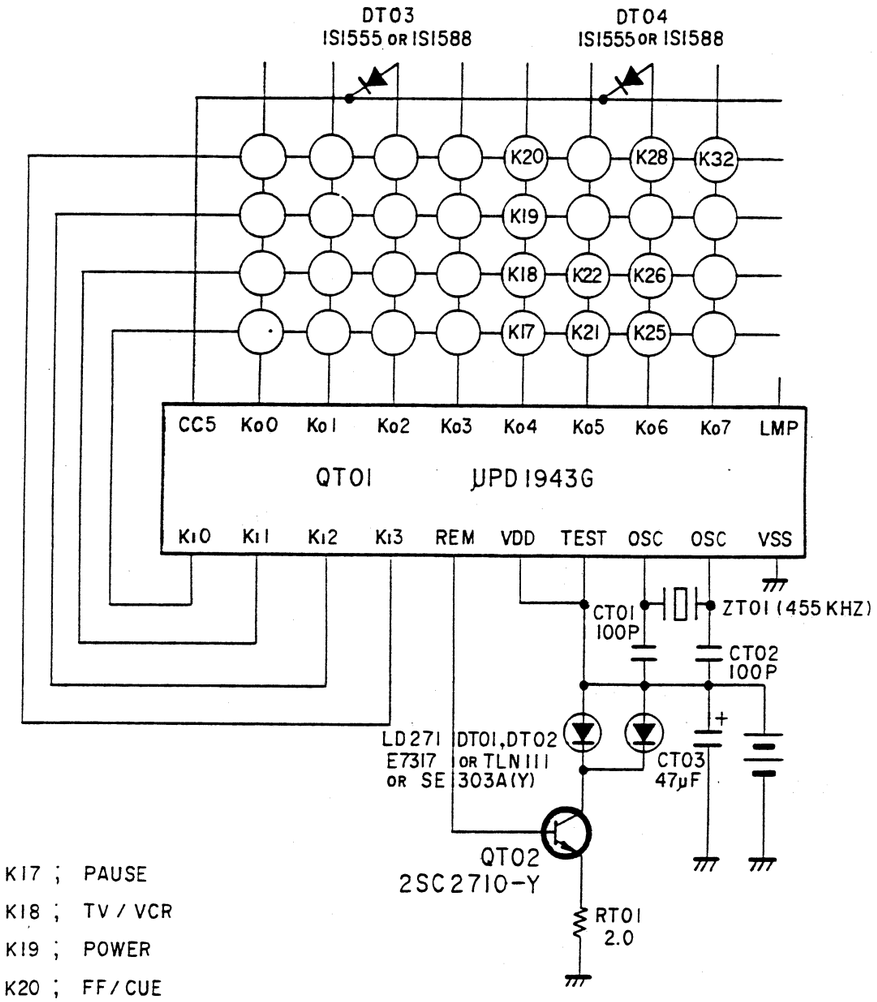


29. Remote Control Transmission Circuit



K17 ; PAUSE
K18 ; TV / VCR
K19 ; POWER
K20 ; FF / CUE
K21 ; STOP
K22 ; PLAY
K25 ; REC
K26 ; REW / REVIEW
K28 ; CH. UP
K32 ; CH. DOWN

29. Remote Control Transmission Circuit



K17 ; PAUSE
K18 ; TV / VCR
K19 ; POWER
K20 ; FF / CUE
K21 ; STOP
K22 ; PLAY
K25 ; REC
K26 ; REW / REVIEW
K28 ; CH. UP
K32 ; CH. DOWN

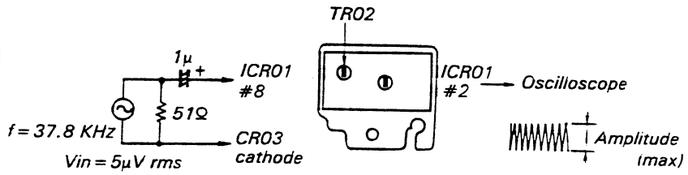
30. Remote Control Adjustment

V-M42 Wireless Remote Control Unit Adjustment Instructions

Adjustment item	Adjustment location	Measurement point	Measuring device	Value	Remarks
Infrared receiver IC sensitivity	TR02	ICR01 #2	Oscilloscope	Output level (max)	input level: 5μV-rms

Method

(Circuit to be measured)



① Apply a 37.8 KHz, 5μV rms signal between ICR01 pin 8 and the cathode of CR03.
② Adjust TR02 so that the amplitude at ICR01 pin 2 becomes maximum.

SERVICE DATA
SUPPLEMENT
FILE NO. 033-102

センターファイル
CENTER FILE

TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-M41TL/42TL

SUMMARY

This Service Data covers only different parts from Service Data for Model V-M41/42 since V-M41TL/42TL are basically the same as Model V-M41/42.

The technical information included in Service Data for V-M41/42 can be used for V-M41TL/42TL servicing.

Technical information on V-M41/M42 is given in the following Service Data.

1. THEORY OF OPERATION (V-M41: File No. 030093-1, V-M42: 030094-1)
2. SERVICING DIAGRAMS (V-M41: File No. 030093-2, V-M42: 030094-2)
3. ADJUSTMENT PROCEDURE(V-M41/42 : File No. 030093-4)

C: CHANGE, A: ADDITION

DIFFERENT PARTS

LO NO	PART NO	DESCRIPTION	PART NO	DESCRIPTION	↓	REMARKS
A101	70812336	FRONT PANEL	70812357	FRONT PANEL	C	FOR V-M41TL only
A101	70812337	"	70812358	"	C	FOR V-M42TL only
A701	70913306	CARTON BOX	70913333	CARTON BOX	C	FOR V-M41TL only
A701	70913303	"	70913340	"	C	FOR V-M42TL only
F801	23144929	FUSE, 1.2A	23144907	FUSE, 1.0A	C	FOR V-M41TL/42TL
P801	70168070	POWER CORD	70168069	POWER CORD	C	"
S801			23145521	SWITCH	A	"
T802	23213801	TRANS,TPW1289	23213780	TRANS,TPW1302	C	"
Y101	70941423	Owner's MANU-AL	70941441	OWNER'S MANUAL	C	FOR V-M41TL only
Y101	70941430	"	70941450	"	C	FOR V-M42TL only
Y104	70942367	CARD, QUICK REFERENCE	70942391	CARD, QUICK RE-FERENCE	C	FOR V-M41TL only
Y104	70942376	"	70942401	"	C	FOR V-M42TL only

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105, JAPAN

SERVICE DATA
FILE NO. 030-094-1

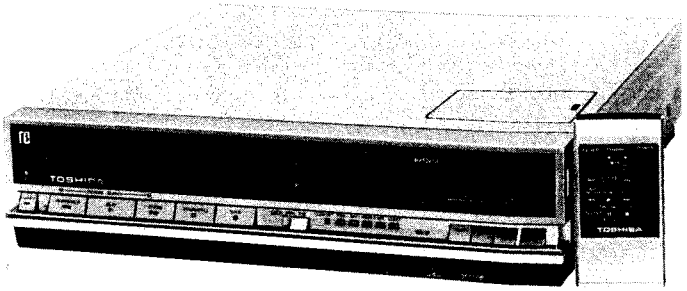
TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-M42/C

THEORY OF OPERATION
(V-M422,423,V-600C,AH-350)

Adjustment procedures are the same as those for the V-M41 chassis. For information on the adjustment procedures, refer to the manual for the V-M41 (FILE No. 030-093-4).



SPECIFICATIONS

GENERAL

Video recording system:	Rotary two-head helical scanning
Head configuration:	2 head rotary (HEAD: A, B)
Video signal:	EIA standard NTSC color
Storage temperature:	−20°C to +60°C (−4°F to +140°F)
Operating temperature:	5°C to 40°C (41°F to 104°F)
Antenna:	75-ohms external antenna terminal for VHF 300-ohms external antenna terminal for UHF
Channel coverage:	VHF channels 2—13 UHF channels 14—83 CATV channels A_2, A_1, A—I, J—W, AA—JJ
VHF output signal:	Channel 3 or 4 (selectable) 75-ohms unbalanced

SWITCH POSITION	CHANNEL
VL ch	2—6
VH ch	A_2, A_1, A—I, 7—13
U ch	14—83
CATV ch	J—W, AA—JJ

Power consumption:	32W (8W with power off)
Weight:	7.7 kg
Dimensions:	420 × 105 × 382 mm (W × H × D)

VIDEO

Input:	VIDEO LINE IN: Pin jack-type connector 1.0V (p-p) 75-ohms unbalanced, sync. negative
Output:	VIDEO LINE OUT: Pin jack-type connector 1.0V (p-p) 75-ohms unbalanced, sync. negative
Signal to noise ratio:	Better than 45 dB

AUDIO

Input:	AUDIO LINE IN: Pin jack-type, 47k-ohms, −10 dBs
Output:	AUDIO LINE OUT: Pin jack-type, less than 10k-ohms, −7 dBs, unbalanced (load: more than 47k-ohms)
Frequency response:	[SII]: 50 Hz to 8 KHz [SIII]: 50 Hz to 7 KHz
Signal to noise ratio:	Better than 40 dB
Audio distortion:	Less than 4% at 400 Hz

TAPE TRANSPORT

Tape speed:	SII 20 mm/sec., SIII 13.3 mm/sec.
Maximum recording time:	300 min. with Toshiba L-830 tape (SIII mode)
Fast forward time:	Within 4.5 min. (L-500)
Rewind time:	Within 4.5 min. (L-500)

TIMER

Fluorescent digital display
Count down from AC line frequency

Remote Control Unit

11 key, 16 modes, Infrared Remote Control Operation

Design and specifications are subject to change without notice.

Caution: The unauthorized recording of television programmes and other materials may infringe on the rights of others.

SAFETY NOTICE

SAFETY PRECAUTIONS

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 ohms per volt or more sensitivity.

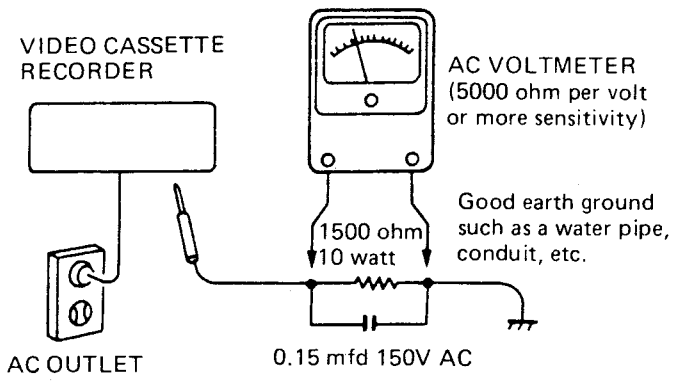
Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet, screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500 ohm resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 volts. A reading exceeding 0.3 volts indicates that a dangerous potential exists, the fault must be located and corrected.

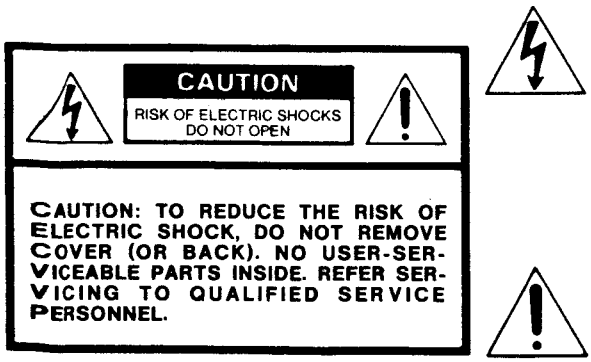
Repeat the above test with the VCR power plug reversed.

NEVER RETURN A VCR TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.

READING SHOULD NOT EXCEED 0.3V


VIDEO CASSETTE RECORDER
AC VOLTMETER (5000 ohm per volt or more sensitivity)
Good earth ground such as a water pipe, conduit, etc.
1500 ohm 10 watt
AC OUTLET
0.15 mfd 150V AC

Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check


CAUTION
RISK OF ELECTRIC SHOCKS DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

CONTENTS

1. THEORY OF OPERATION

1-1 General 1
- (1) ANTENNA CONNECTION 1
- (2) SET YOUR TELEVISION TO THE VCR CHANNEL 2
- (3) IDENTIFICATION OF CONTROLS 3
- (4) SETTING THE PRESENT TIME 5
- (5) CHANNEL SELECTION 6
- (6) RECORDING A TV PROGRAM 7
- (7) PLAYBACK 8
- (8) OTHER PLAYBACK MODES 9
- (9) PROGRAMMABLE TIMER 10
- (10) SETTING THE PROGRAMMABLE TIMER 11
- (11) ONE TOUCH TIMER RECORDING 13
- (12) REMOTE CONTROL OPERATION 15
- (13) CAMERA RECORDING 16

1-2 Power Supply Circuits 17
- (1) Outline 17
- (2) Differences from V-M41 17

1-3 ANT Input/Output and Receiver Circuits 17
- (1) Outline 17
- (2) Differences from V-M41 17

1-4 Timer, Channel Selector, and Electronic Counter Circuits 17
- (1) Outline 17
- (2) Differences from V-M41 17
- (3) Functions 18
- (4) Operation 18

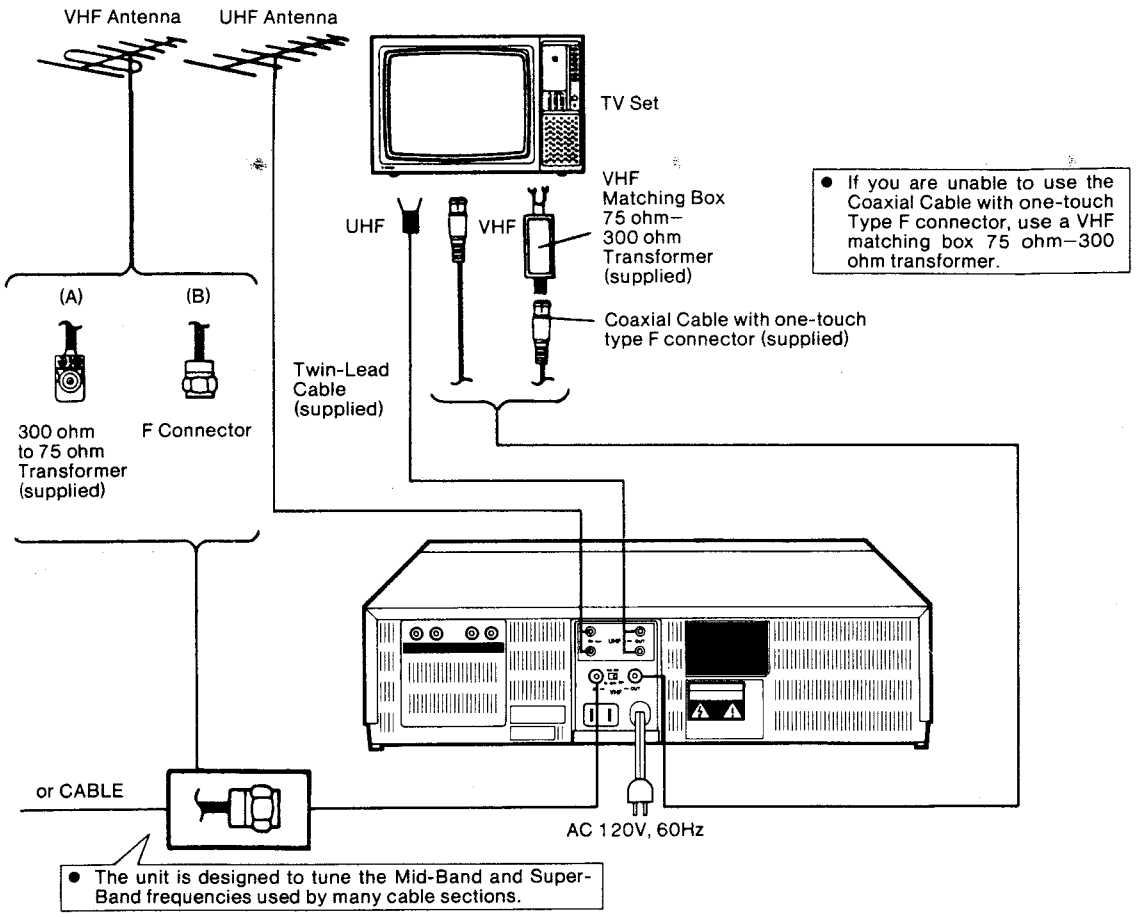
1-5 Logic Circuit 22
- (1) Outline 22
- (2) Differences from V-M41 22
- (3) Deceleration 22

1-6 Wireless Remote Control Circuit 26
- (1) Outline 26
- (2) Functions 26
- (3) Transmission circuit 26
- (4) Infra-red receiver circuit 29

NOTE:
The servo, video, and audio circuits are the same as those of the V-M41. Therefore, they are not described here.

ANTENNA CONNECTION

1. Remove the Antenna Cable from the TV set. Connect it to the "VHF IN", "UHF IN" Terminal of the VCR.
2. Connect one end of the Antenna Cable and Twin-lead cable to the "VHF OUT", "UHF OUT" Terminal of the VCR.
3. Connect the other end to the "VHF", "UHF" Terminal of the TV.


VHF Antenna
UHF Antenna
TV Set
VHF
Matching Box
75 ohm–
300 ohm
Transformer
(supplied)
UHF
VHF
● If you are unable to use the Coaxial Cable with one-touch Type F connector, use a VHF matching box 75 ohm–300 ohm transformer.
Coaxial Cable with one-touch type F connector (supplied)
(A)
(B)
Twin-Lead Cable (supplied)
300 ohm to 75 ohm Transformer (supplied)
F Connector
or CABLE
AC 120V, 60Hz
● The unit is designed to tune the Mid-Band and Super-Band frequencies used by many cable sections.

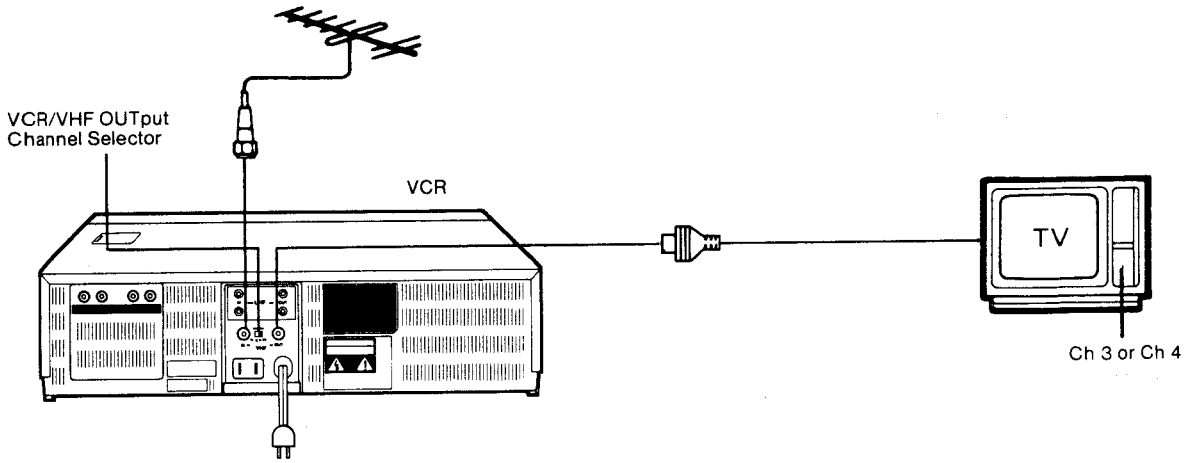
NOTE TO CATV SYSTEM INSTALLER:

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

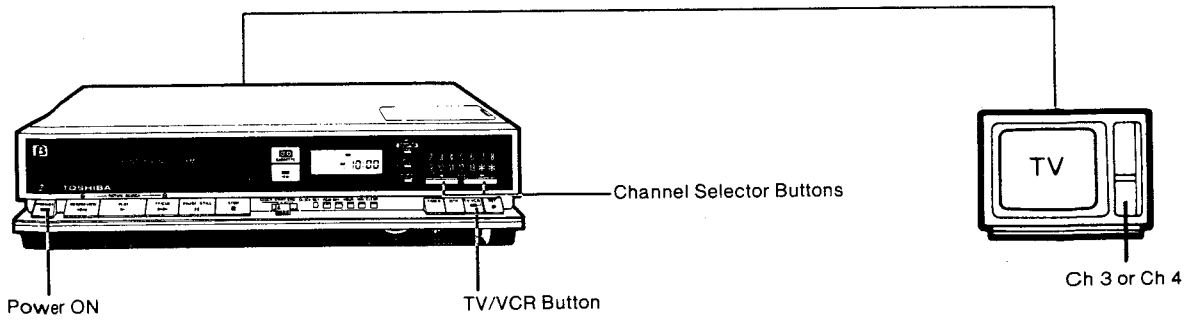
In the above configuration, you can record programs from CATV channels as well as VHF channels 2 through 13. You can record programs from 117 CATV channels except scrambled channels.

SET YOUR TELEVISION TO THE VCR CHANNEL

1. Set your TV to channel 3 unless channel 3 is one of the TV stations in your area. If channel 3 is used in your area, set your TV to channel 4 and slide the VCR/VHF OUTput Channel Selector toward channel 4. The VCR/VHF OUTput Channel Selector is located on the rear panel at left side of the antenna connector. This is the VCR channel on your television set. Your television receiver must be tuned to this channel any time a video cassette is played back on the VCR.



2. Plug the VCR power cord into a 120V electrical outlet and press the "**POWER**" button. The "**POWER**" lamp will light. The clock will flash repeatedly. This is not a malfunction
3. Press the "**TV/VCR**" button. The VCR lamp will light. Select an active TV channel by pushing the VCR Channel Selector Buttons. The picture from that channel should now be displayed on your television.



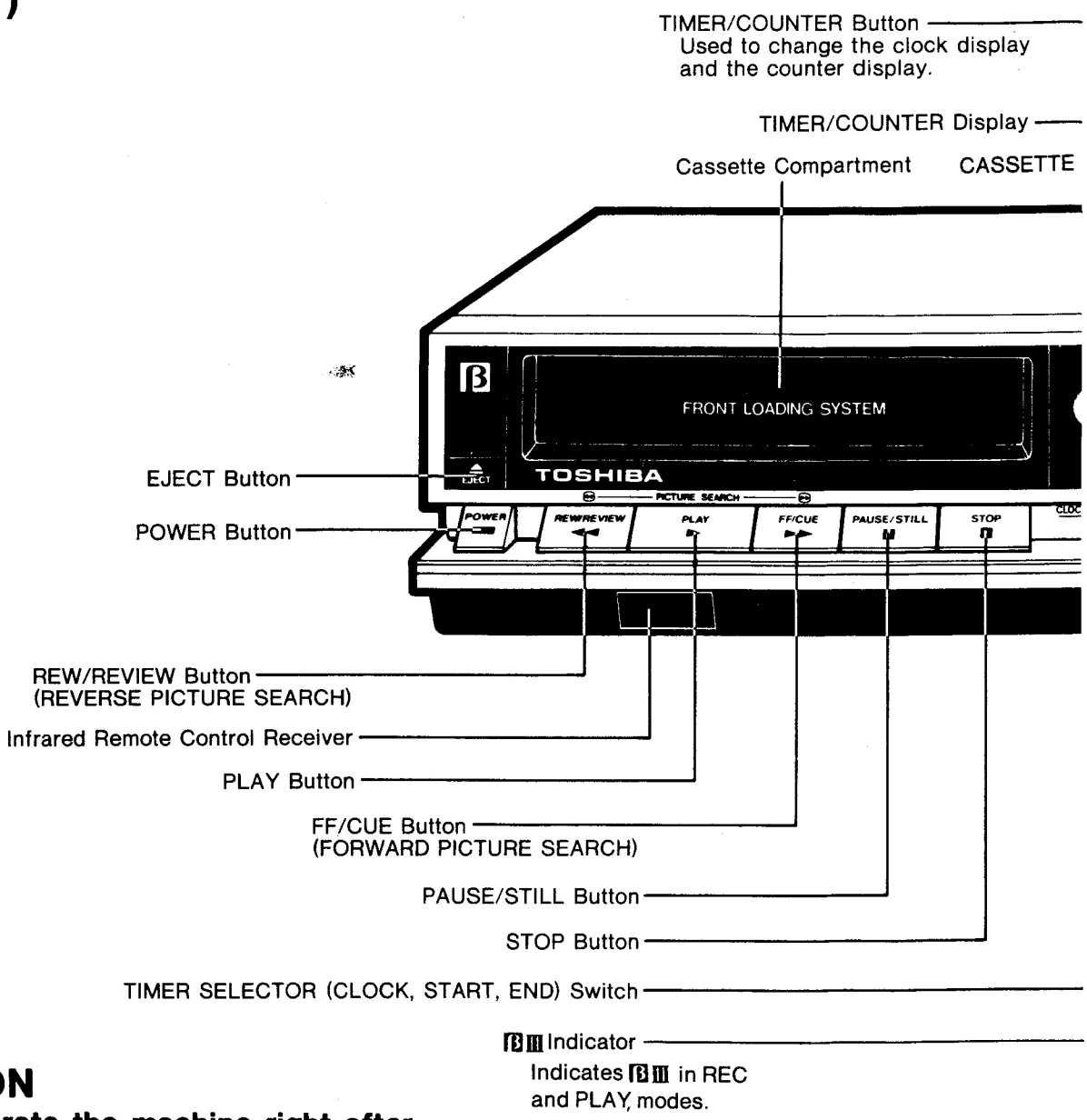
NORMAL TV VIEWING

1. Turn ON your TV receiver. There is no need to turn the POWER switch of VCR ON.
2. Tune your TV receiver to the channel you want to watch.

* The TV/VCR button should be set to TV position (The VCR Indicator lamp goes OFF.) if the POWER button is turned ON.

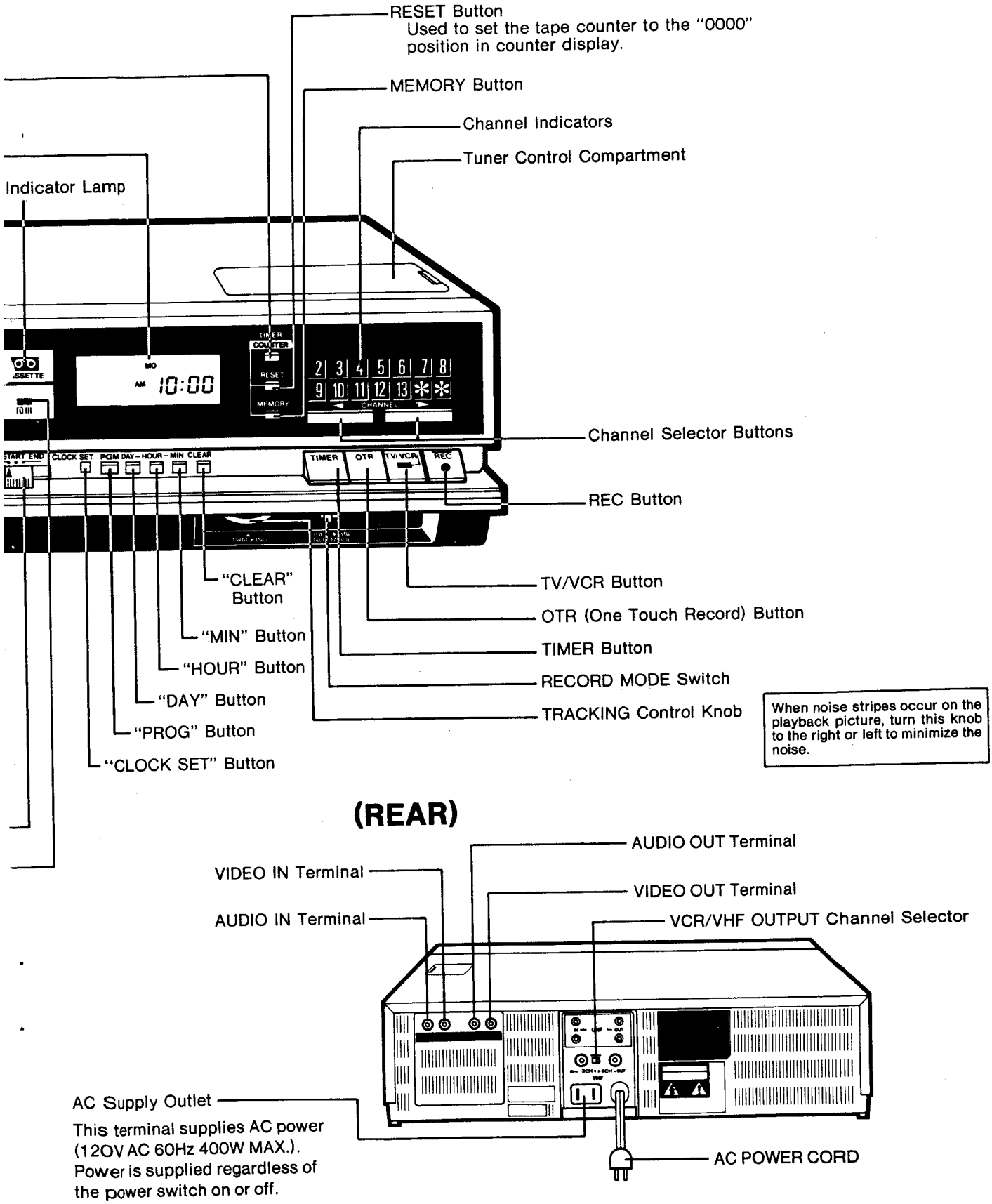
IDENTIFICATION OF CONTROLS

(FRONT)



CAUTION

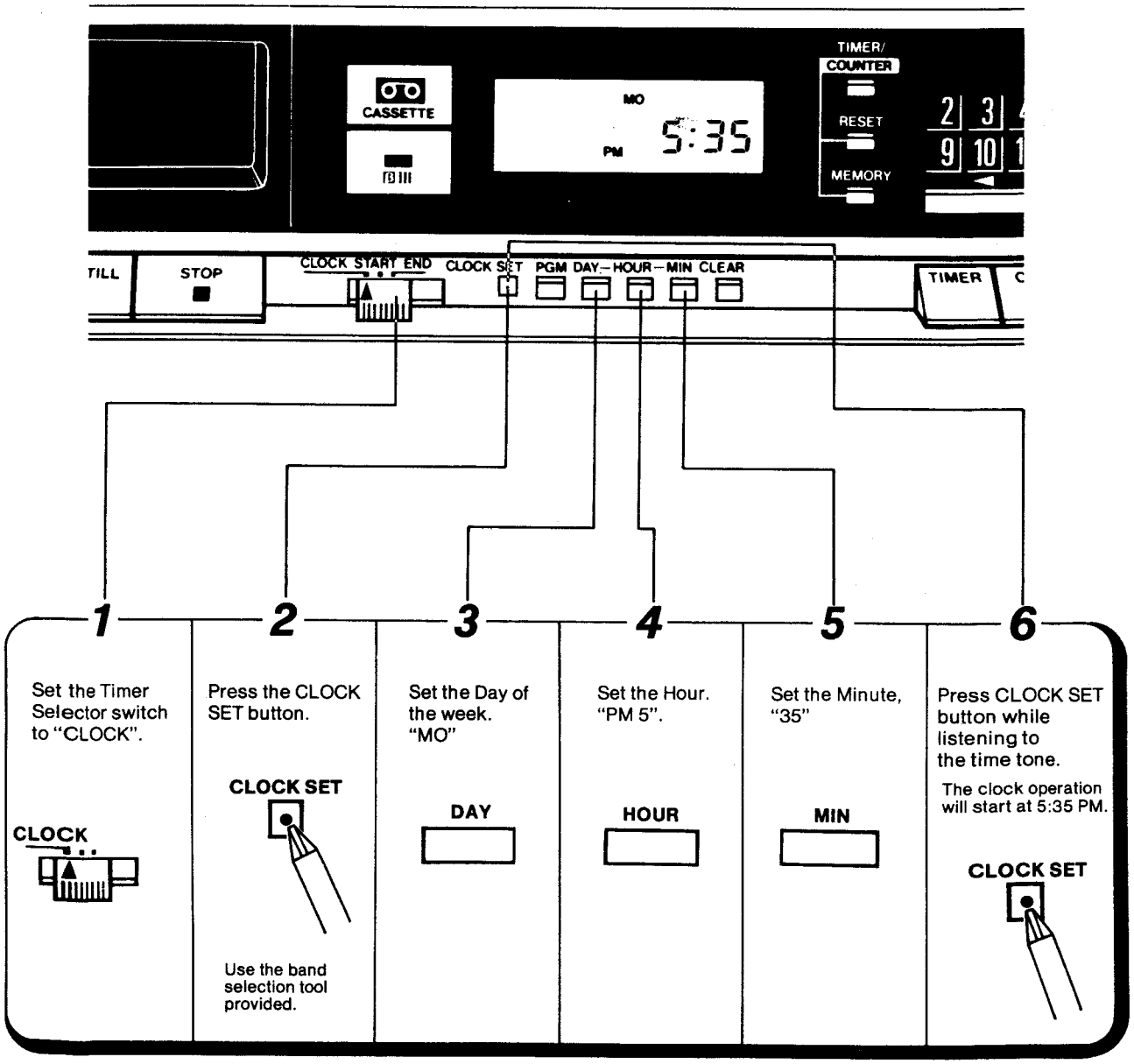
Never operate the machine right after having transported it from a cold location directly to a warm location.
Wait for about an hour and a half to two hours.
This is because, in such a case, moisture may condense on the head cylinder inside the machine.
The tape will tend to stick to the head cylinder and will be damaged.


RESET Button
Used to set the tape counter to the "0000" position in counter display.
MEMORY Button
Channel Indicators
Tuner Control Compartment
Indicator Lamp
Channel Selector Buttons
REC Button
"CLEAR" Button
TV/VCR Button
OTR (One Touch Record) Button
"MIN" Button
TIMER Button
"HOUR" Button
RECORD MODE Switch
"DAY" Button
TRACKING Control Knob
"PROG" Button
"CLOCK SET" Button
When noise stripes occur on the playback picture, turn this knob to the right or left to minimize the noise.
(REAR)
AUDIO OUT Terminal
VIDEO IN Terminal
VIDEO OUT Terminal
AUDIO IN Terminal
VCR/VHF OUTPUT Channel Selector
AC Supply Outlet
This terminal supplies AC power (120V AC 60Hz 400W MAX.). Power is supplied regardless of the power switch on or off.
AC POWER CORD

SETTING THE PRESENT TIME

This clock provides a 12-hour display. The time display brightness will automatically darken from 10 PM to 6 AM.

Example: Monday, 5:35 PM



When a power interruption occurs:

After about 10 minutes of power interruption, the clock display will flash. Reset the video timer again after setting the clock.

CHANNEL SELECTION

This video recorder has been preadjusted for VHF channels 2 through 13. To receive other VHF and UHF channels, or when rearranging the channel order, reset them as follows.

1

Turn the TV power on and set the VCR channel (Channel 3 or 4).

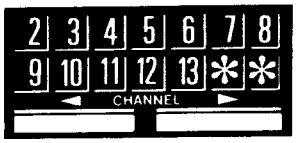
2

Turn the VCR power on.

Press the TV/VCR button to VCR.

3

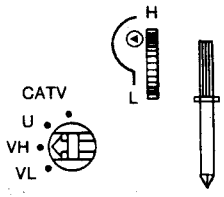
Select the channel to be adjusted by pushing channel button.

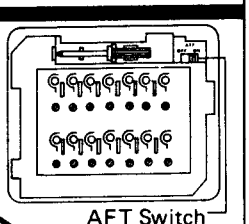


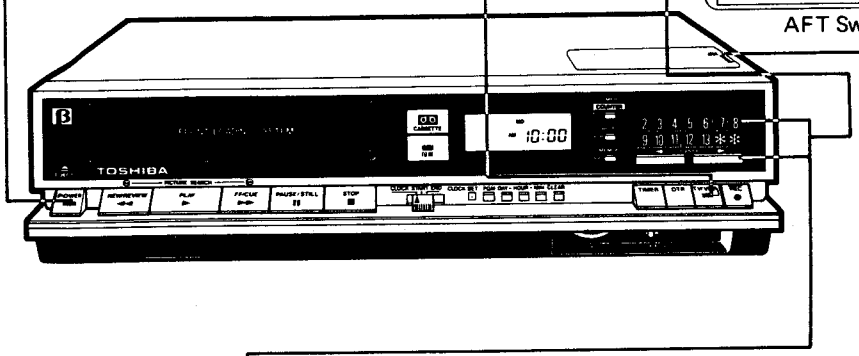
4

① Open the cover and set AFT switch to "OFF".
② Select the channel range with the attached band selection screwdriver.

V_L	CH	2-6
V_H	CH	A_2, A_1, A to I, 7-13
U	CH	14-83
CATV	CH	J-W, AA to JJ

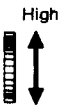






③ Turn the tuning knob so that the desired channel has excellent picture and sound.

Larger numbered channels are found by rotating the knob to High. Smaller numbered channels rotated to Low.

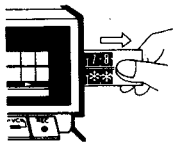


5

- Next, reset the other channel buttons by repeating 3 and 4.
- Turn the AFT switch "ON" and close the cover.

Replace the labels to match the new channel order.

① Pull the number plate out.



② Remove the number labels and cut off the label.

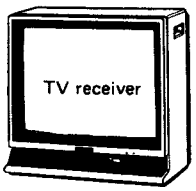
③ Select a channel number tag and place it on the number plate.

④ Replace the number plate.

RECORDING A TV PROGRAM

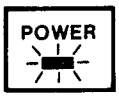
1

Turn the TV power on and set the VCR channel. (Channel 3 or 4)



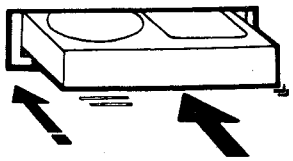
2

Turn the VCR power on.

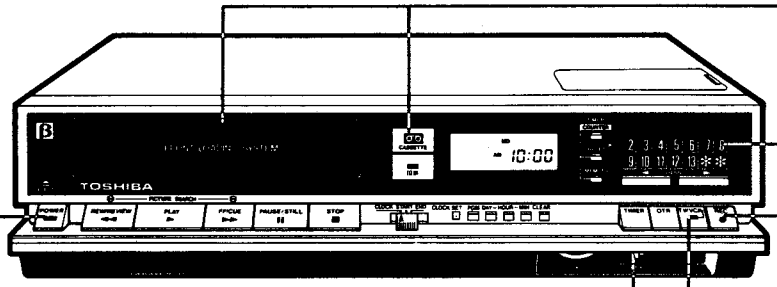


3

Insert a video cassette. The cassette indicator lamp flashes until the cassette is installed properly.



Confirm that the cassette tab is not broken.



Notes: 1. Any AUDIO or VIDEO INput should be disconnected from the terminals.

2. To change a channel during recording, press the PAUSE/STILL button, select the desired new channel then press the PAUSE/STILL button to continue the recording.

4

Press the TV/VCR button to VCR.

5

Press the Channel Selector buttons to desired channel. At this time, set the Record Mode switch to SP or EP

6

Press the REC button.

● Press the PAUSE/STILL button to eliminate unnecessary material.

Although the program continues on the TV screen, the tape is stopped and video recording is not performed. To resume video recording, press the PAUSE/STILL button again. Unnecessary material can be eliminated with this procedure.

Note: If pause is continued for about 10 minutes, the recorder returns to the stop mode in order to protect the tape and internal video recorder components.

● Viewing another program while recording.

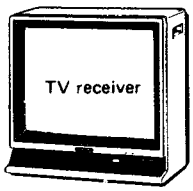
If two desired programs are on at the same time, one program can be viewed while the other is being recorded.

1. Start recording one program by following procedures 1 to 6 above.
2. Press the TV/VCR button to TV. (Lamp goes off.)
3. Select the desired TV channel for viewing by using the TV channel selector of your TV receiver.

PLAYBACK

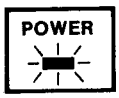
1

Turn the TV power on and set the VCR channel. (Channel 3 or 4.)



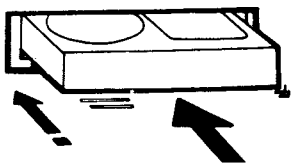
2

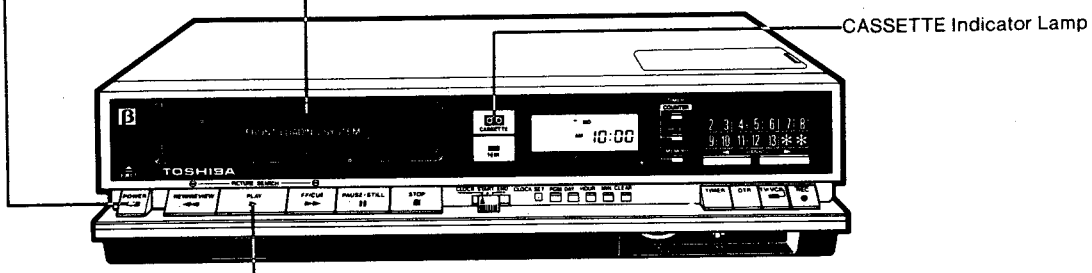
Turn the VCR power on.



3

Insert a video cassette correctly.





4

Press the PLAY button.
The playback picture appears on the TV after about 2 or 3 seconds.
At this time, TV/VCR button is automatically switched to VCR.

■ **To stop playback:**
Press the STOP button.
Next, press the EJECT button to remove the video cassette. The cassette indicator lamp flashes until the video cassette comes out.

■ **Tape speed**
Video cassettes recorded by ⅡⅡ and ⅢⅢ tape speeds can be viewed with this VCR. The tape speed is automatically set during playback.

■ **Auto Rewind**
When a video cassette tape ends during playback and recording (except timer recording), the auto rewind automatically rewinds the tape.

OTHER PLAYBACK MODES

1. Slow Playback

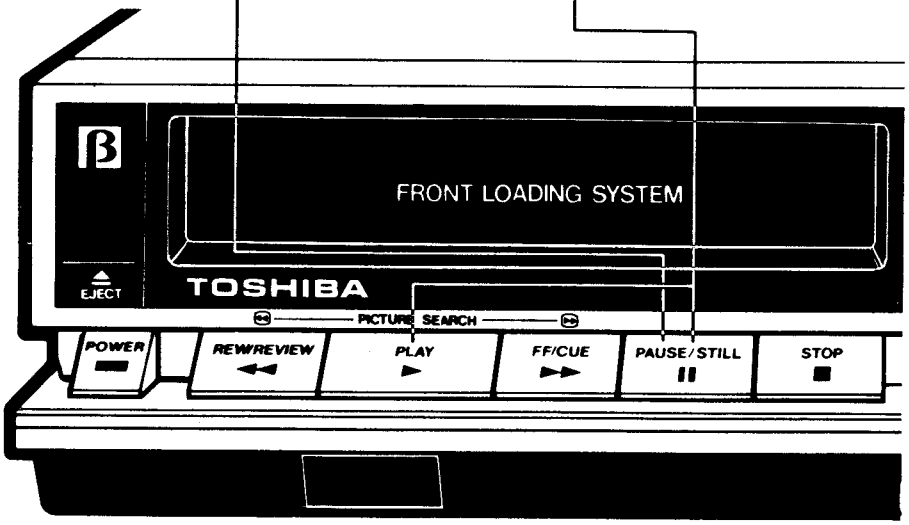
1. Press the PLAY button.
2. Press the PAUSE/STILL button.
3. Slow playback at 1/8 the speed of standard playback can be viewed while the PLAY button is pressed.
   For frame by frame operation, press and release PLAY button to advance the picture one frame at a time.
4. Press the PAUSE/STILL button to return to normal playback.

2. Still picture playback

To freeze the picture, press the PAUSE/STILL button during PLAY mode.

Notes

1. The sound is muted and picture noise may occasionally occur during still/slow picture playback. This does not indicate a malfunction.
2. Still/slow picture returns to normal playback after about 5 minutes to protect the tape.
3. A distorted picture occurs during still/slow picture of a ß II mode recording.



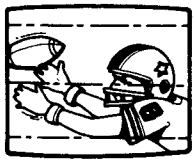
3. Picture Search

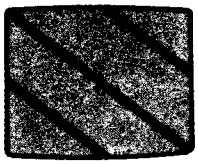
Review or Cue allow playback at about 8 times the normal speed, and repeated rewind or fast forward can be performed with quick search. It is very convenient during search for a particular section on the tape.

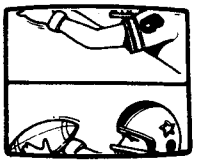
① Press the PLAY button.	② Press the REW/REVIEW (FF/CUE) button.	③ Press the REW/REVIEW (FF/CUE) button.	④ Press the PLAY button.
Normal playback appear.	Rewind playback (fast forward playback) at about 8 times normal speed	Rewind (fast forward)	Standard playback

Note: Review playback (cue playback) and rewind (fast forward) are alternately selected by repeating (2) and (3).

- Several static horizontal noise lines will appear during picture search. The sound is muted.
- When the picture is shifted horizontally during picture search, adjust the TV horizontal control knob.
- When the picture shifts vertically during picture search, adjust the TV vertical control knob.







Note: During Picture Search operation, ß II mode pictures will be distorted.

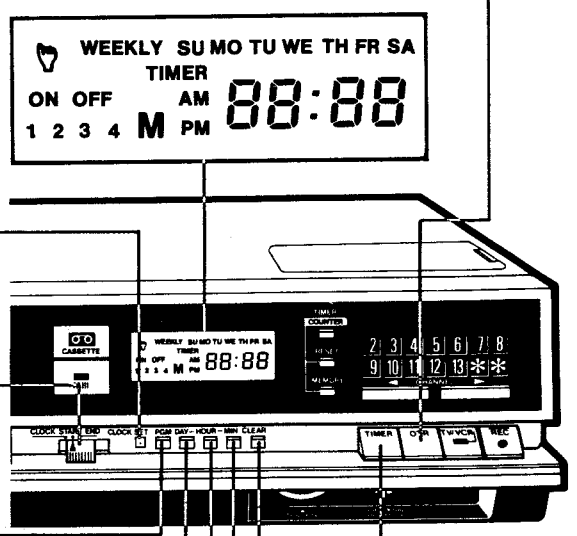
PROGRAMMABLE TIMER

* The timer can be preset to record up to four programs on one specific day of the week or at the same time every day, or at different times on different days of the week.
* If power to the VCR is interrupted, the clock will continue to run and the programmed instructions will be retained for about 10 minutes.
  After 10 minutes of power interruption, if the clock flashes SU AM 12 : 00, the clock and program contents will have to be reset.

* The clock used is of the 12-hour type.

OTR Button
- Used to carry out recording in units of 30 minutes in normal mode.
  * Current time → 30 min → 60 min →
- Used to specify the timer on time in units of 30 minutes.
  30 → 60 → 90 → 120 → 150 →

CLOCK SET button
- Used to set the present time.
- When this button is pressed once, the unit enters clock set mode. When the button is pressed again, clock set mode is released.



Timer Selector Switch
- CLOCK mode
  For the present time display.
- START mode
  For checking and setting the timer on time.
- END mode
  For checking and setting the timer on and off time.

PGM Button
- Used to specify the program number 1–4.

Timer Button

DAY Button
- Used to set the day of the week.
- When the button is pressed once, the day of the week advances by one. When the button is kept depressed, the days advance rapidly.

<Example>
One day of the week; "SU"
Same day of every week; "WEEKLY SU"
Everyday; "SU. MO. TU. . . SA"

CLEAR Button
- Used to cancel the preset program.

MIN Button
- Used to set the minute digits.
- When the button is pressed once, the digit advances by 1.
  When the button is kept depressed, the digits advance rapidly.

00 → 01 → 02 → 03 → 59 ↺

HOUR Button
- Used to set the hours.
- When the button is pressed once, the digit advances by 1.
  When the button is kept depressed, the digits advance rapidly.

SETTING THE PROGRAMMABLE TIMER

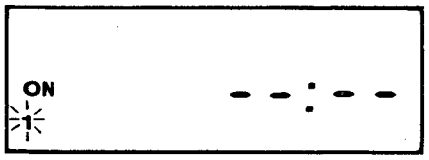
- Confirm the present time. If the present time is not correct, set it again.
- Press the POWER button on.
- Insert the cassette (Check that the cassette tab has not been removed.)
- Preset desired programs as follows.
- When setting the programmable timer, be careful not to overlap recording time zone.
- Display when four programs are overlapped.

1 Set the Timer Selector switch to START.
2 Specify the program number 1–with the "PGM" button.
3 Select the program you want to see with the Channel Selector buttons.
4 Set the day of the week, the hour and minutes of recording on time (SU → MO → - - - - → SA → WEEKLY SU → WEEKLY MO → - - - - → WEEKLY SA → SU. MO TU. . . SA. SU → - - - -) with "DAY", "HOUR " and "MIN" buttons.
5 Set the Timer Selector switch to END.
6 Set the end time with "HOUR" and "MIN" buttons.
7 To preset more programs repeat steps 1 – 6 . (Max. 4 programs).
8 Return the Timer Selector switch to CLOCK.
9 Press the TIMER button.

Timer recording

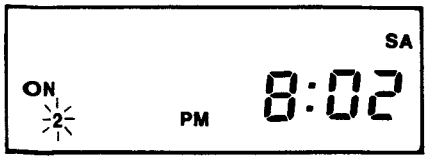
Example: To set channel 6 on Saturday from PM 8:02 to PM 9:45 as program 2. (Present day/time, Tuesday, AM 8:21.)

(1) Set the Timer Selector switch to START.

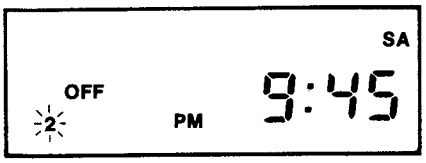


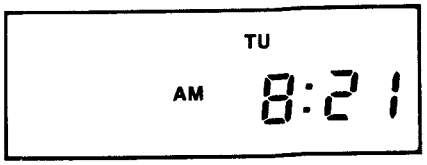
(When timer is not set to program 1)

(2) Set the program number ..... "2"
(3) Set the recording channel ..... "6"
(4) Set the day of the week ..... "SA"
(5) Set the timer on hour ..... "PM 8"
(6) Set the timer on minute ..... "02"

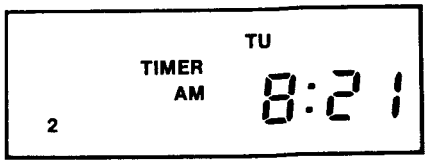


(7) Set the Timer Selector switch to END.
(8) Set the timer off hour ..... "PM 9"
(9) Set the timer off minute ..... "45"





(10)Set the Timer Selector switch to CLOCK.
The display returns to the present time display and the program number* goes off.



Note: Timer advances during setting.

Press the TIMER button to end the timer setting.

TIMER is displayed and the power indicator goes off.

Notes:

1. When no cassette is loaded or the tab of the cassette has been removed, timer recording is not possible. In this condition, Error is displayed at the first digit of the timer when the TIMER button is pressed.
2. During timer recording, the preset contents (program number, channel, day of the week of timer on/off time) cannot be changed.

To check the timer setting

(1) Set the Timer Selector switch to START.
(2) Press the "PGM" button to display the program number to be checked ..... "2"
The display shows the preset timer on time and channel ..... "PM 8:02" and "6"
(3) Set the Timer Selector switch to END.
The display shows the preset timer off time ..... "PM 9:45"
(4) Set the Timer Selector switch to CLOCK.

Note:
When the Timer Selector switch is set to START or END, the channel indicator lights.

To change or cancel the timer setting

(1) Set the Timer Selector switch to START.
(2) Press the "PGM" button to display the program number to be changed or cancelled.
(3) Press the "CLEAR" button. The timer on/off time and channel are erased.

Note:
- The timer setting can be cancelled only when the Timer Selector switch is set to START.

ONE TOUCH TIMER RECORDING

The One Touch timer recording function permits unattended recording for a maximum of five hours. Also, each time the OTR button is pressed during normal mode the recording time is extended 30 minutes. When setting the time, timer off time can be set in 30 minute increments after setting the timer off time.

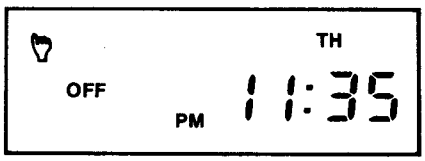
Notes: 1. Thirty minutes are added every time the OTR button is pressed for up to five hours (seven times). The one touch time can only be set in 30-minute units. When the OTR button is pressed several times, or the OTR button is switched to the timer button, press the TIMER button within nine seconds.
2. One touch timer operation is possible only when power is supplied and the Timer Selector switch is set to CLOCK.

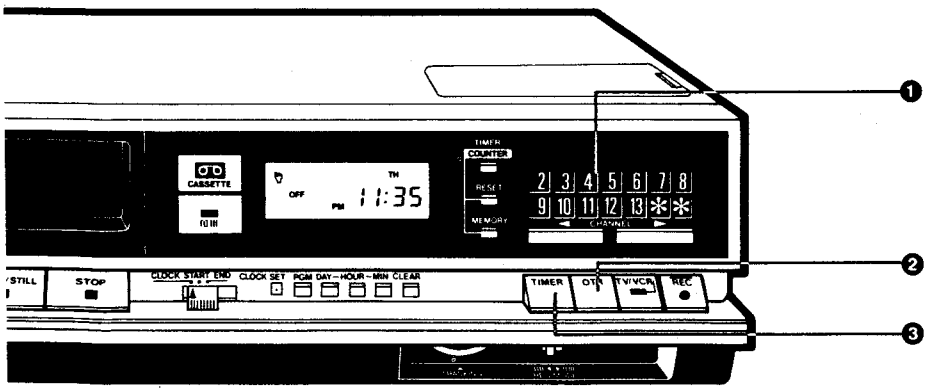
Example: To record channel 4 starting from now for 1-1/2 hours. (Present day/time, Thursday, PM 10:05)

(1) Select channel 4 by pressing channel selector button.
(2) Press the OTR button to set the recording time.
When the button is pressed once: PM 10:35 (30 minutes)
When the button is pressed twice: PM 11:05 (1 hour)
When the button is pressed three times: PM 11:35 (1 hour 30 minutes)
(3) Press the TIMER button within 9 seconds.

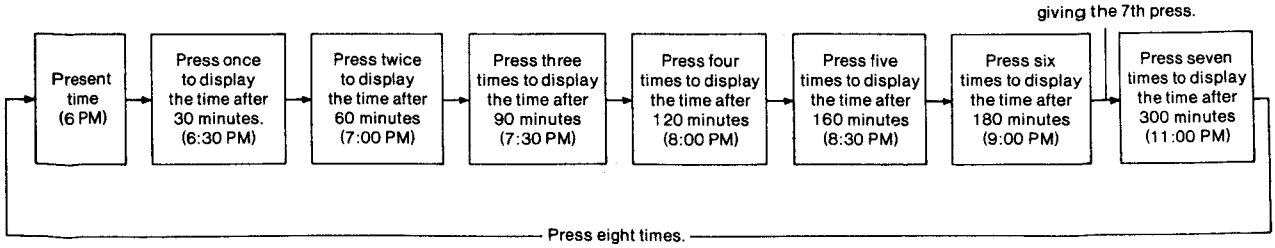
Present time

Timer off time





Note:
Display of the timer advances 2 hours by giving the 7th press.


Present time (6 PM)
Press once to display the time after 30 minutes. (6:30 PM)
Press twice to display the time after 60 minutes (7:00 PM)
Press three times to display the time after 90 minutes (7:30 PM)
Press four times to display the time after 120 minutes (8:00 PM)
Press five times to display the time after 160 minutes (8:30 PM)
Press six times to display the time after 180 minutes (9:00 PM)
Press seven times to display the time after 300 minutes (11:00 PM)
Press eight times.

Example: To set channel 6 starting from Saturday, PM 8:02 for 1 hour as program 1. (Present day/time, Tuesday, AM 8:21)

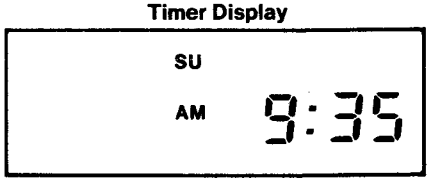
(1) For the program, channel and timer on time setting, refer to steps (1)–(6) of "Timer recording".
(2) Set the Timer Selector switch to END.
(3) Press the OTR button twice.
(4) Set the Timer Selector switch to CLOCK.
(5) Press the TIMER button to complete the timer setting.
"TIMER" indicator lights.

Note:
When the OTR button is pressed once, the time increases by 30 minutes.
30 min → 60 min → 90 min → 120 min → 150 min → 180 min . . . →

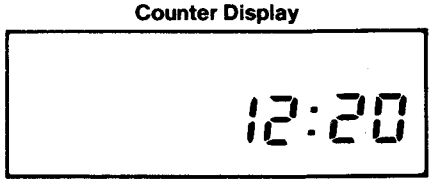
Error indication
When the TIMER button is pressed without setting the timer on/off time, or a cassette whose safety tab has been removed is loaded, the "E" indicator lights (when the TIMER button is pressed).

TIMER/COUNTER display: The indication of TIMER/COUNTER display can be changed with TIMER/COUNTER button.

Timer Display



Counter Display



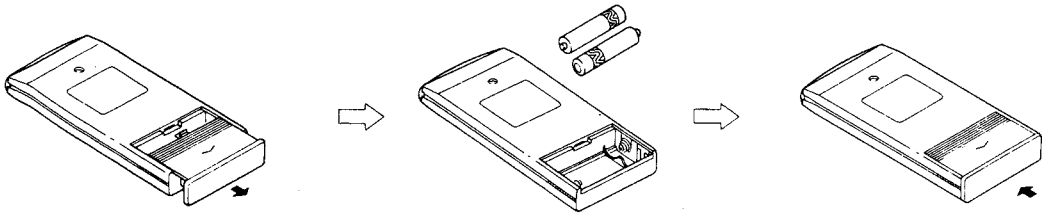
MEMORY function: When the MEMORY button is pressed, the "M" indicator is displayed and the tape stops at the set counter reading between 0000–9997 during rewinding. (This does not function in picture search or fast forward mode.)

Note:
The counter operates even when it functions as a clock.

REMOTE CONTROL OPERATION

INSTALLING BATTERIES

How to install batteries in the Remote Control Unit



Remove the battery cover on the reverse side of the unit.

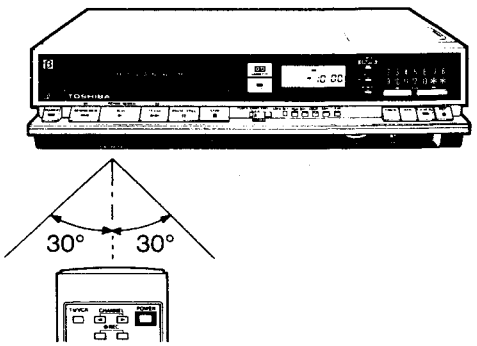
Install 2 batteries ("AA" size) into the unit.
Note: Carefully install batteries to match the polarity diagrams.

Close the battery cover.

REMOTE CONTROL OPERATION RANGE

The Remote Control must have a clear line of sight to the sensor on the front of the VCR. It must be within an angle of 30° either side of center. The maximum operating distance is about 23 feet.

Point the front end of the Remote Control at the VCR.

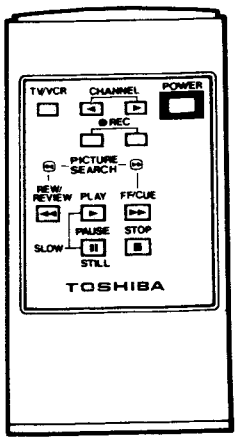


REMOTE CONTROL BUTTON FUNCTIONS

The remote control unit allows remote operation of 15 modes:
PLAYback, STILL picture, SLOW playback, Frame advance, CUE, REVIEW, Fast Forward, Rewind, PAUSE, STOP, TV/VCR, CHANNEL up, CHANNEL down, REC, and POWER ON/OFF.

Notes:

1. Remote control cannot be operated in the following conditions:
   1) In timer recording mode
   2) Without a cassette in the cassette compartment
   However, TV/VCR, CHANNEL, and POWER modes can be operated by remote control.
2. When using remote control unit, press control buttons at intervals of about one second to ensure correct operation.
3. During PAUSE/STILL mode a few noise bars will appear. If the noise bars appear in the middle of the screen, press the PLAY button until the noise bars appear at the top or bottom of the screen and give the best picture.
4. If the remote control unit is not to be used for a long period of time, remove the batteries to avoid possible damage from battery corrosion.
5. Keep unit away from extremely hot or humid places and avoid mechanical shock.

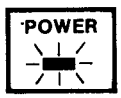


CAMERA RECORDING

Camera recording can be easily performed indoors by following this simple procedure.

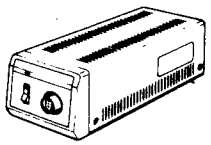
1

Connect the video camera. Turn the VCR and TV power on, then insert a cassette. (Set the TV to the VCR channel).



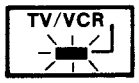
2

Turn the camera AC adaptor (optional) power on.



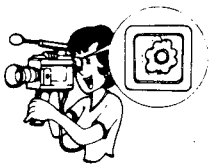
3

Press the TV/VCR button to VCR. The picture is shown on the TV.



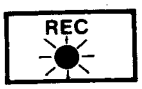
4

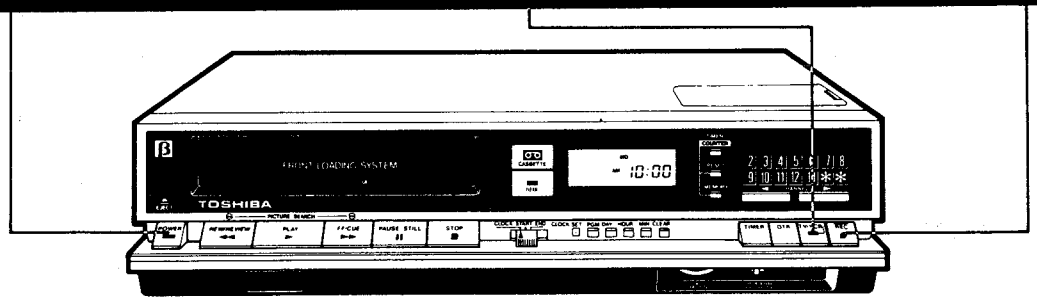
Adjust the camera. (See the camera owner's manual.)



5

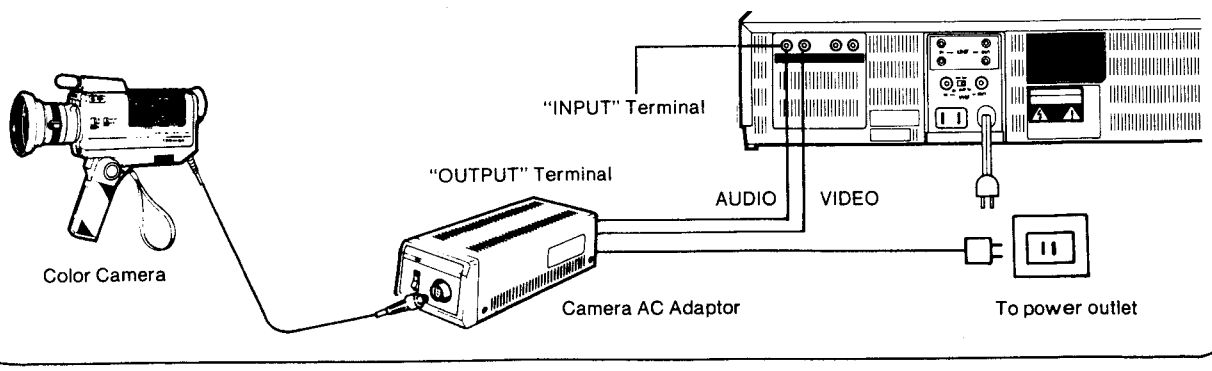
Press the REC button.





- **To stop recording:**
  Press the STOP button.
  Press the EJECT button to remove the cassette.
- **To stop recording temporarily during video recording:**
  Press the PAUSE/STILL button.
  Press it again, then recording starts again. If pause continues for about 10 minutes, the VCR stops to protect the cassette tape and internal video recordig components.
- **When a "beep" sounds during recording:**
  This occurs because the camera's built-in microphone is too close to the TV speaker. Move the camera away from the TV or reduce the TV speaker volume.

Camera Connection



(d) Channel selection

Channels are selected by performing the following routines.

- Selection keys (Operation)
- ICL01 (Key process)
- ICX01 (BCD code generation)
- PIF selector (Tuning operation)

The selected channel is displayed as follows: First, channel selection data (BCD code) from the timer microcomputer are decoded into 10 parallel signals by the decoder IC (ICA30) and light LEDs. The mute signal (AFT defeat signal) is output from the timer microcomputer while channels are being switched as shown in Figure 1-3.

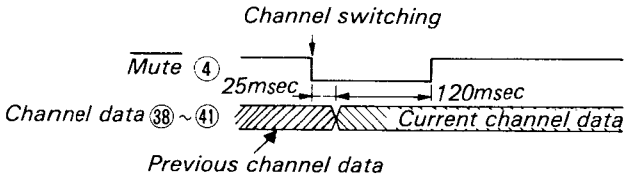


Fig. 1-3 Timing chart at channel switching

(e) Electronic counter

The counter is operated by performing the following routines.

- Take-up reel table
- Hall element (Rotation detection)
- ICL08 (Amplification)
- ICL01 (Noise elemination)
- ICX01 (Pulse count)
- Fluorescent display tube (Display)

The count direction is controlled by the Up/Down signal sent from the logic submicrocomputer.

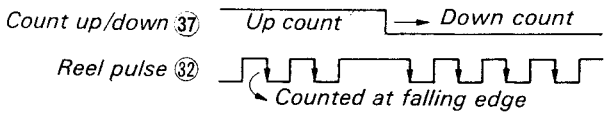


Fig. 1-4 Reel pulse count timing

(f) Fluorescent display tube

- The fluorescent display can be switched between the time, time reserved by timer, counter number, etc.
- It employs a dynamic drive system that sequentially lights up each segment based on the grid and segment pulses from the microcomputer.
- The fluorescent display tube is a kind of triode tube and lights up when both the grid voltage Ec and plate voltage Eb are +27 V with respect to the filament center voltage (−22 V).
- To extinguish the display tube, Ec or Eb must be kept at a minus 4 V with respect to the filament center voltage.

(g) Power interruption backup

Programmed information is maintained after power interruption of ten minutes or less. When a power interruption occurs, the display tube will not light. But after power is restored, the colon will flash to indicate that there was a power interruption.

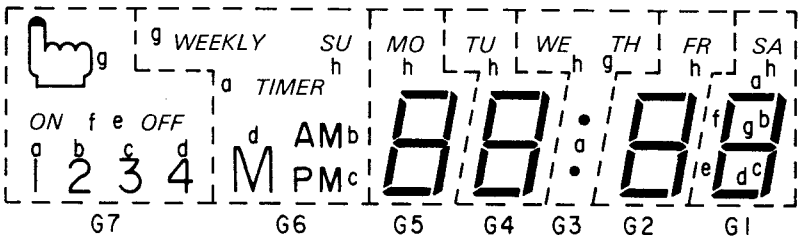


Fig. 1-5 Relationship between grids and segments of GX01

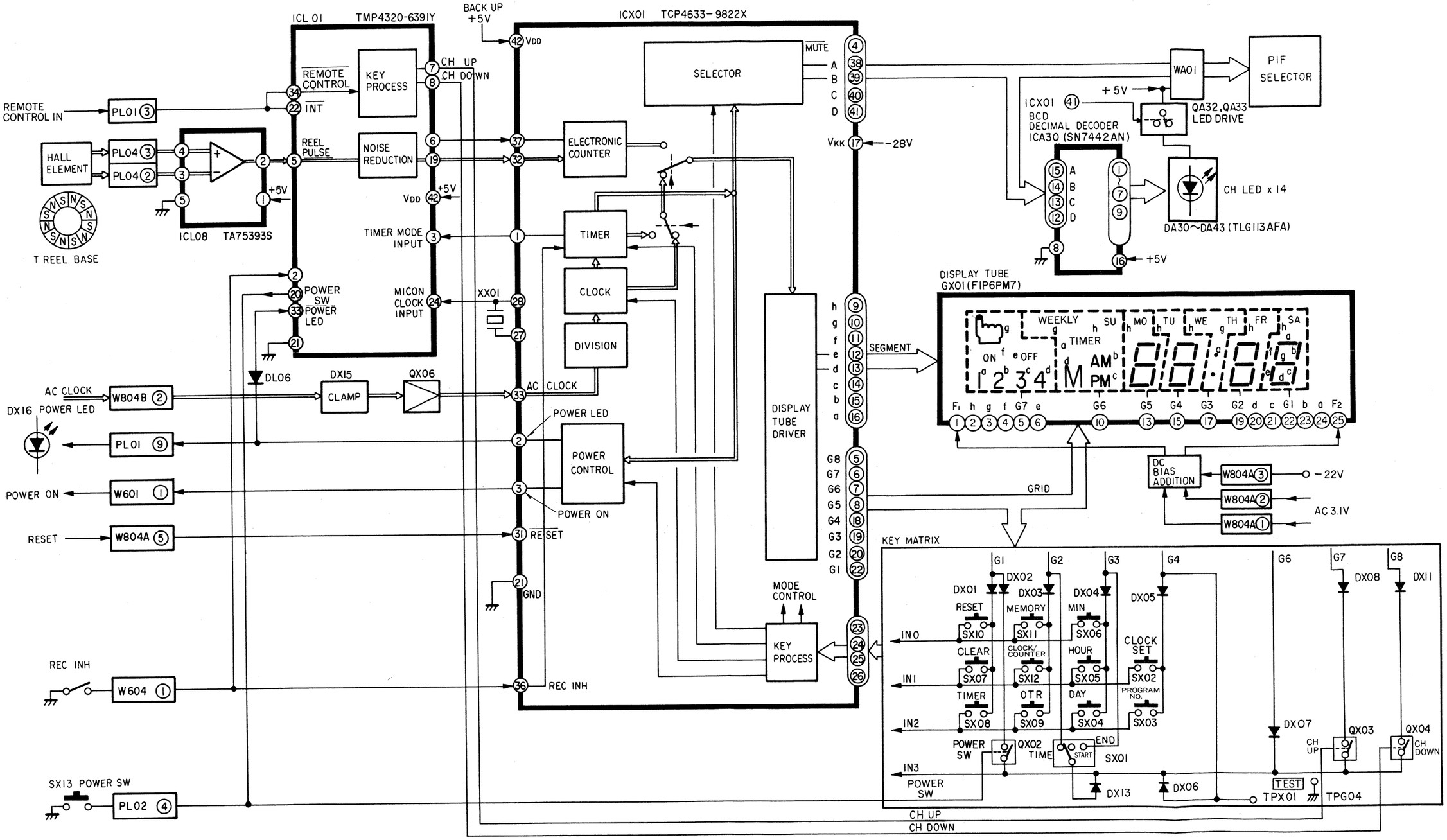


Fig. 1-6 Timer, channel selector and electronic counter block diagrams

1-5 Logic Circuit

(1) Outline

The logic circuit is made up of: two microcomputers, TMP4320-6358Y for system control, which is called syscon-main, and TMP4320-6391Y for button operations, LED display, remote control process, etc. which are called syscon-sub; a servo logic power unit, which is used for system control; a timer selector unit, which is used for the LED display and to indicate the operation of each mode; and a logic switch unit. A cam system is employed in the mechanical control system to control each operation mode and a slot-in mechanism is used for tape loading. All of these mechanisms operate under the electronic logic control of the two microcomputers.

(2) Difference from V-M41

There are two differences between the V-M41 and the V-M42.

① Dew detection (Input to pin 36 of ICL01)

When a dew detection signal is input, the V-M42 stops and only accepts operation commands from the EJECT, TV/VCR, and Channel buttons. Also, if a cassette is inserted into the compartment, it will be rejected shortly thereafter.

② Counter memory stop (Counter 0000 signal is input to pin ④ of ICL01)

When counter memory is used, the V-M42 stops when the counter reads 0000.

(3) Deceleration

When the counter memory is on and the tape is rewound, the V-M42 starts decelerating when the counter reads 0299 or less. The reel motor voltage is controlled by timer counter microcomputer ICX01, which refers to the rotating speed of the take-up reel table.

The output signal at pin ㉟ of ICX01 is usually low so that Q623 is off. During deceleration, the brake pulse shown in Fig. 1-7 is output at pin ㉟. The integrated voltage derived from this brake pulse is then applied to the base of Q623, and the base potential of Q626 is lowered by the collector current of Q623, which is set by R646, so that the reel motor voltage becomes less than it usually is during rewinding.

Because the reel motor voltage is controlled by changing in base voltage of Q 623, the tape can be stopped in the exact position. When the reel motor starts to rotate, the signal at pin ⑩ of IC601 (main microcomputer) is high. Therefore, deceleration is not active.

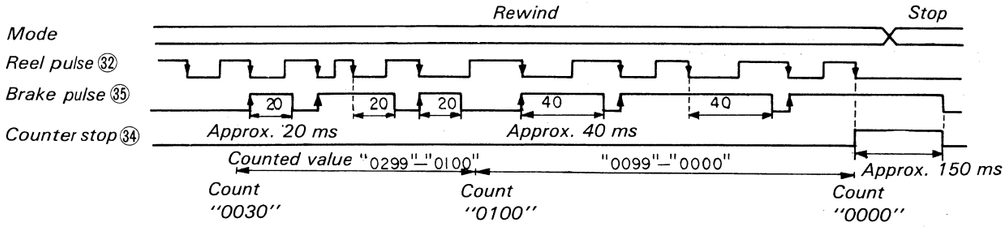


Fig. 1-7 Brake pulse output timing during operation of counter "0000" stop

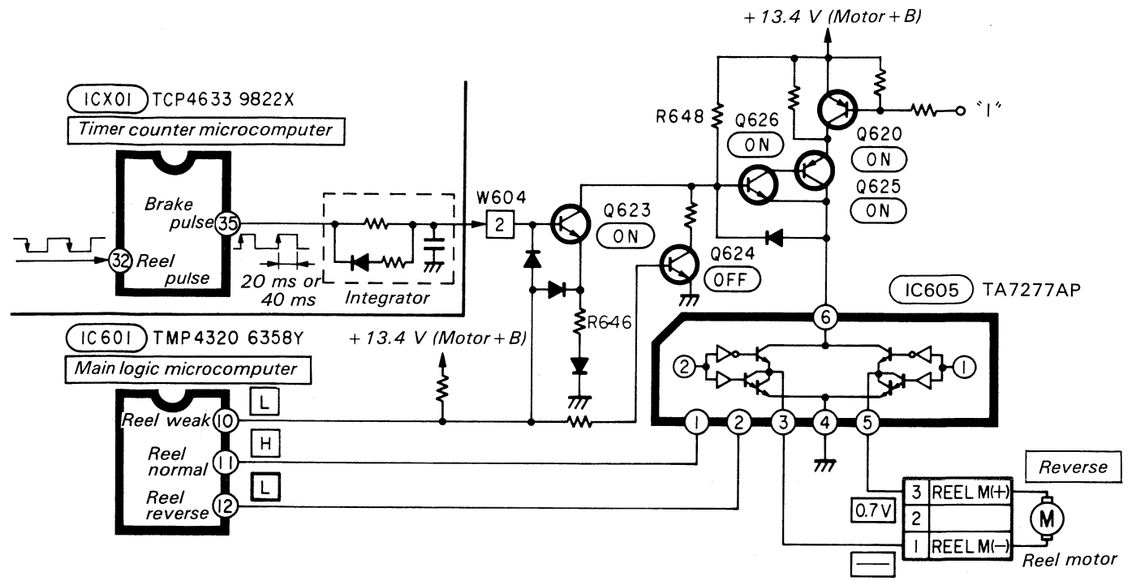


Fig. 1-8 Deceleration operation block diagram

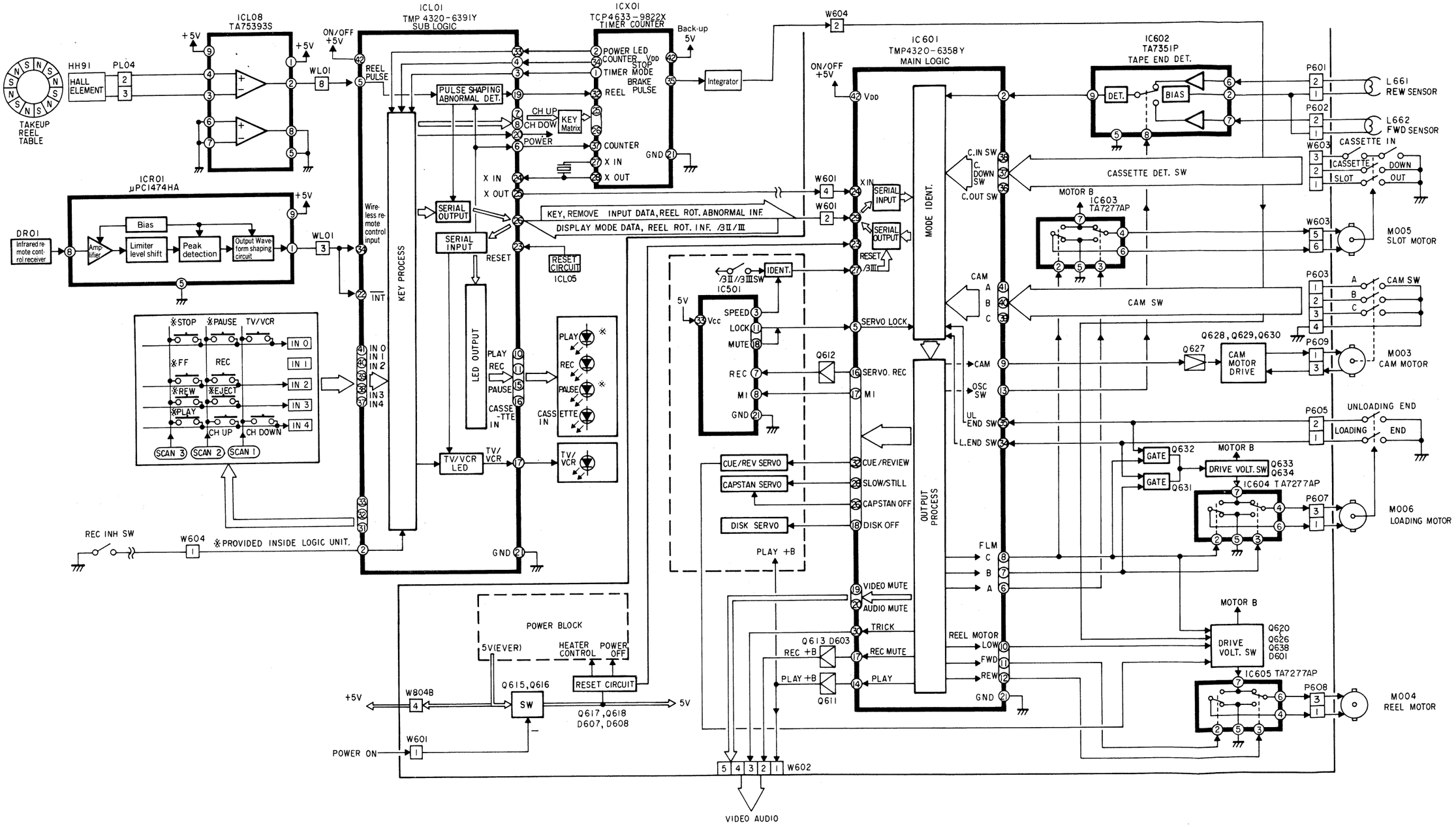


Fig. 1-9 Mechanism and system control block diagram

1-6 Wireless Remote Control Circuit

Remote control: VC-M42

(1) Outline

The VC-M42, wireless remote control unit uses infrared ray pulse modulation. It has 11 keys and performs 15 functions to control VCRs. These are described below.

(2) Functions

VCR (11 keys)

① PLAY	② STILL	③ FF	④ REW
⑤ CUE	⑥ REVIEW	⑦ PAUSE	⑧ SLOW
⑨ STOP	⑩ REC	⑪ TV/VCR	⑫ CH UP
⑬ CH DOWN	⑭ POWER	⑮ FRAME BY FRAME	

(3) Transmission circuit

Figure 1-10 is a block diagram of the transmission circuit. ICμPD1943G for VCR transmission is used in the transmission circuit.

The transmission signal is divided into two time periods: the first period, during which the transfer data code is sent and the second period and following, during which only the leader code (created while a key is pressed) is sent. The leader code and an eight-bit custom code and an eight-bit data code are transmitted during the first period. One transmission period is a total of 32 bits because the reverse of the custom and data codes are sent at the same time. The custom code varies between models (0010 0010 for VCRs). The data code is different for each transmission key.

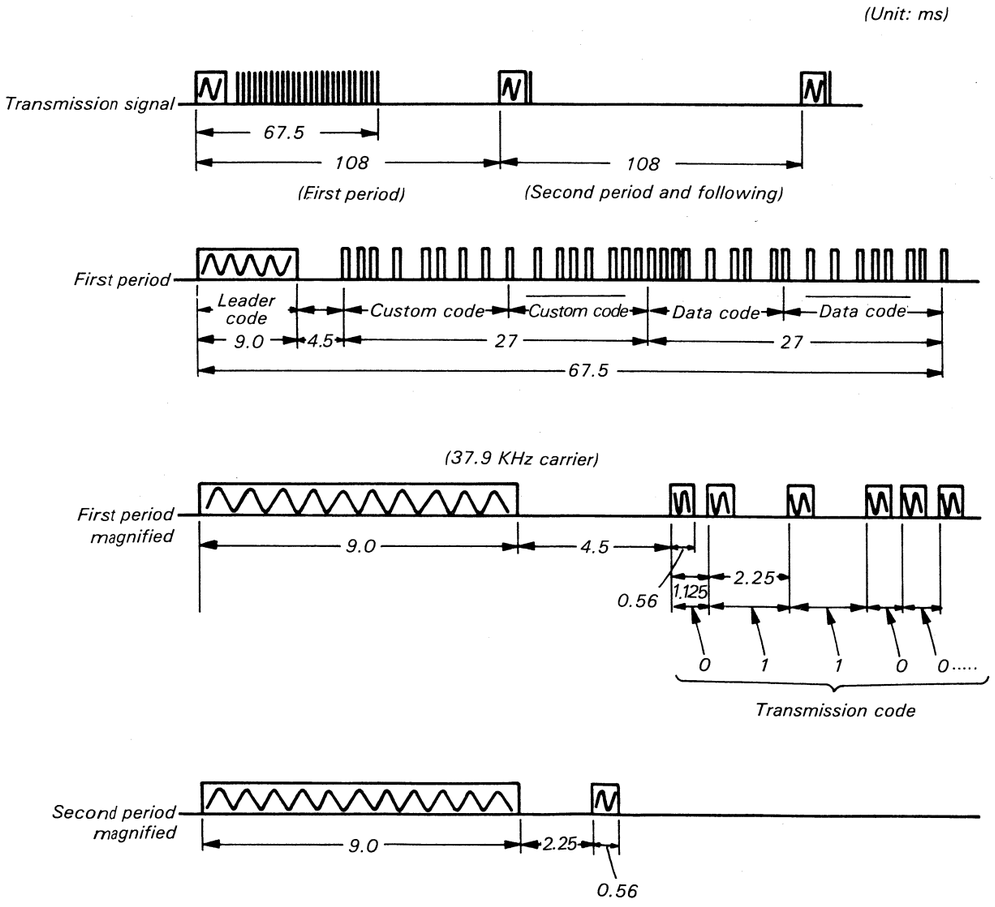


Fig. 1-10 Transmission code

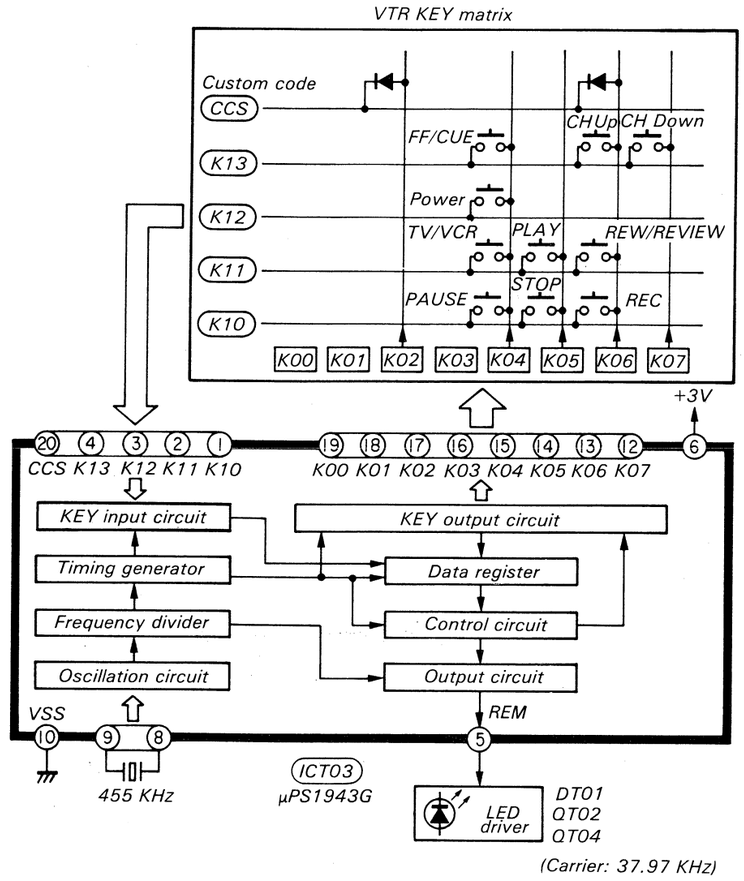
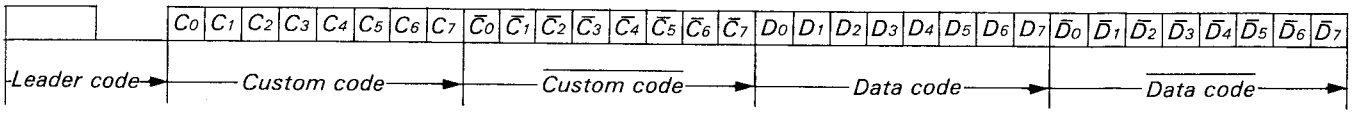


Fig. 1-11 Remote control transmission circuit block diagram

The transmission code is converted to pulse-position modulation (PPM) to identify the code.

0: Time between pulses is 1.25 ms.
1: Time between pulses is 2.25 ms.

The above transmission code used in the VC-M42 to prevent operation errors between models. The transmission codes are listed in Table 1-1.


C0 C1 C2 C3 C4 C5 C6 C7 C̄0 C̄1 C̄2 C̄3 C̄4 C̄5 C̄6 C̄7 D0 D1 D2 D3 D4 D5 D6 D7 D̄0 D̄1 D̄2 D̄3 D̄4 D̄5 D̄6 D̄7
Leader code
Custom code
Custom code
Data code
Data code

	Function	Custom code								Data code							
		C_0	C_1	C_2	C_3	C_4	C_5	C_6	C_7	D_0	D_1	D_2	D_3	D_4	D_5	D_6	D_7
VIDEO	PAUSE/STILL	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0
	TV/VCR	0	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0
	POWER	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0
	FF/CUE	0	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0
	STOP	0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0
	PLAY	0	0	1	0	0	0	1	0	1	0	1	0	1	0	0	0
	RECORD	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0
	REW/REVIEW	0	0	1	0	0	0	1	0	1	0	0	1	1	0	0	0
	CH UP	0	0	1	0	0	0	1	0	1	1	0	1	1	0	0	0
	CH DOWN	0	0	1	0	0	0	1	0	1	1	1	1	1	0	0	0

Table 1-1 Transmission code

(4) Infra-red receiver circuit

The remote control infra-red receiver circuit detects the remote control signal by using a ICμPC1474HA receiver preamplifier, which contains a carrier amplifier, peak detector, and output waveform shaper.

Figure 1-12 illustrates the remote control infra-red receiver circuit block dagram.

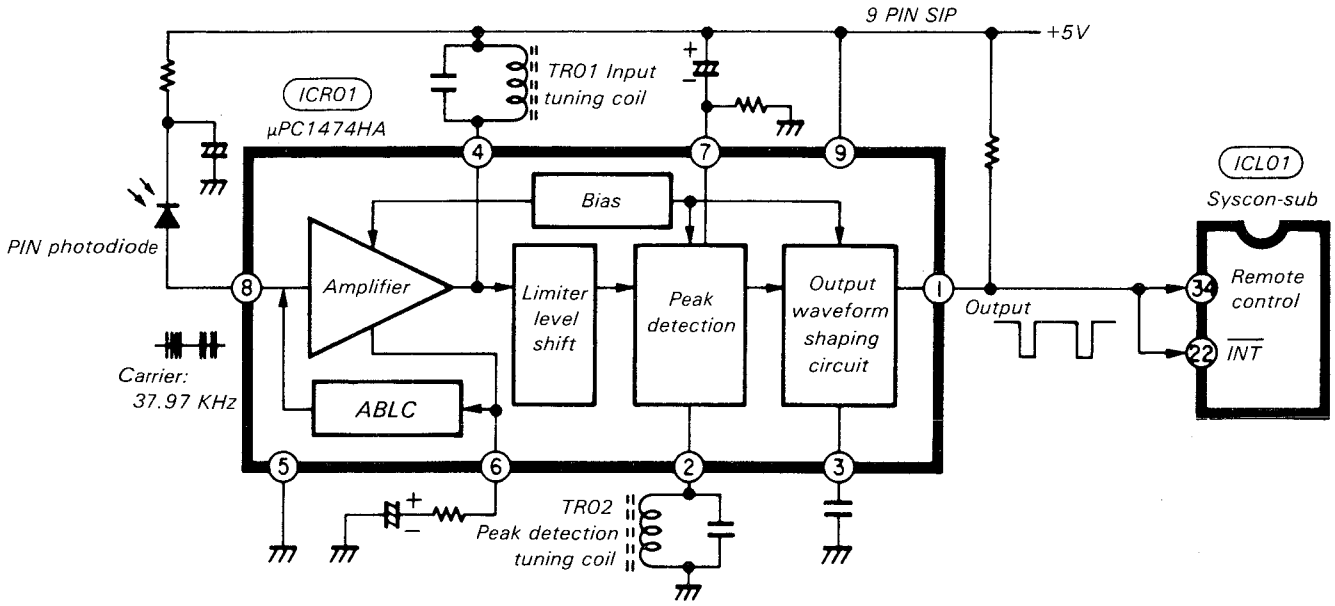


Fig. 1-12 Remote control infra-red receiver circuit block diagram